

The copy filmed here has been reproduced thanks to the generosity of:

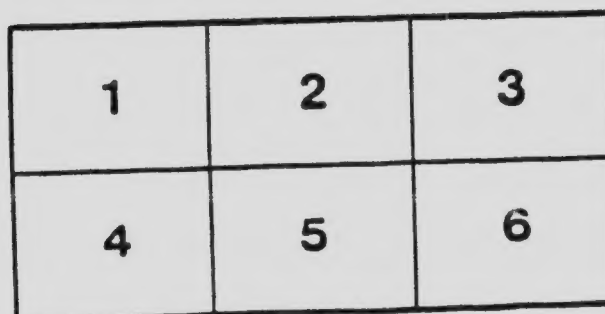
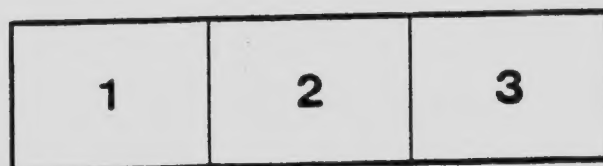
Special Collections Division
University of British Columbia Library

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \longrightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

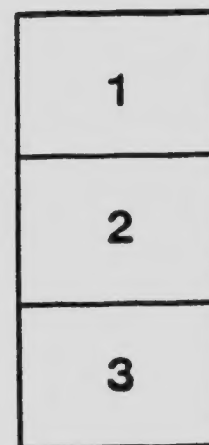
Special Collections Division
University of British Columbia Library

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \longrightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



Dr. Westbrook,
with J. Porter's
Compliments.

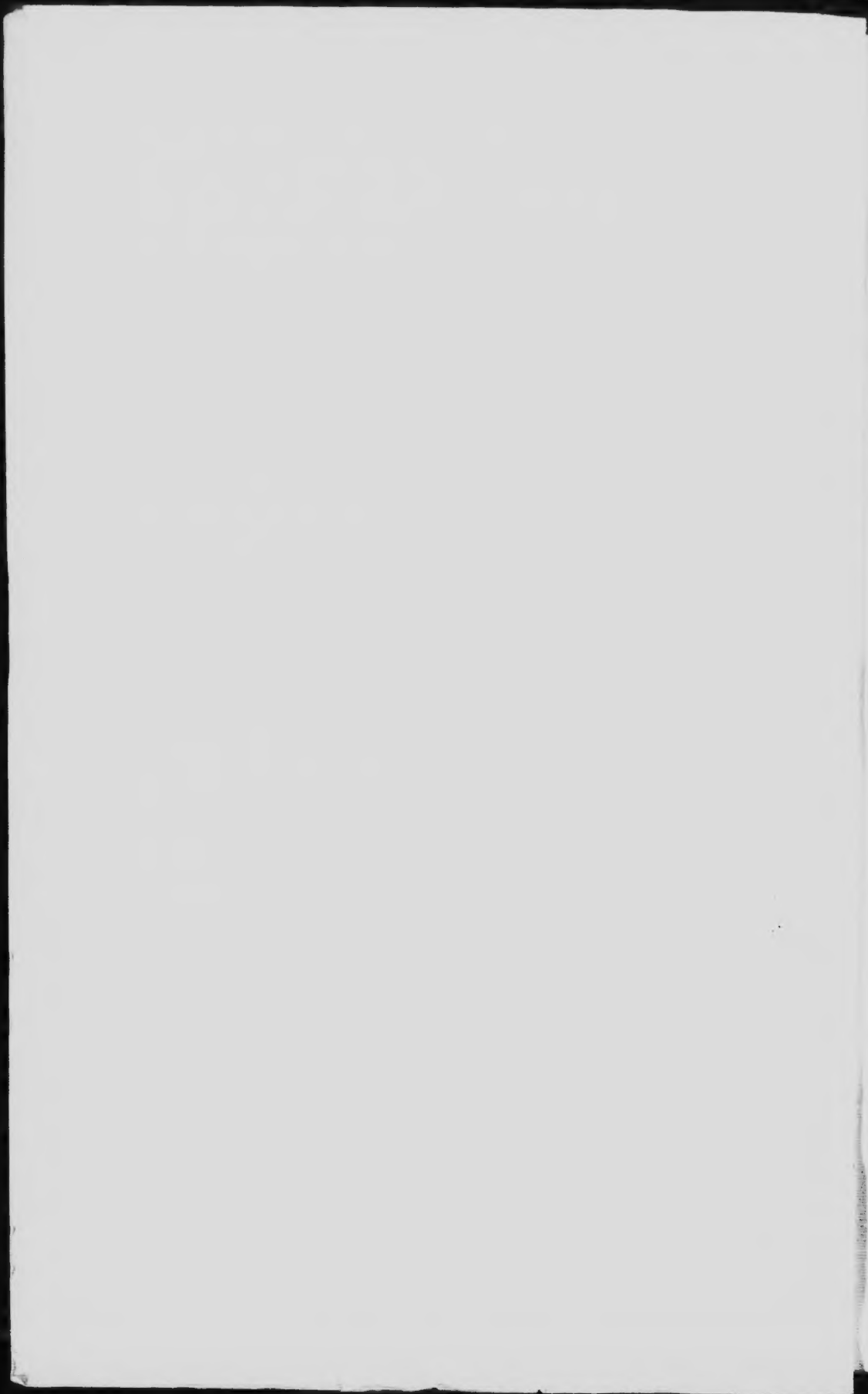


The
**NORTHERN
CORDILLERAN**

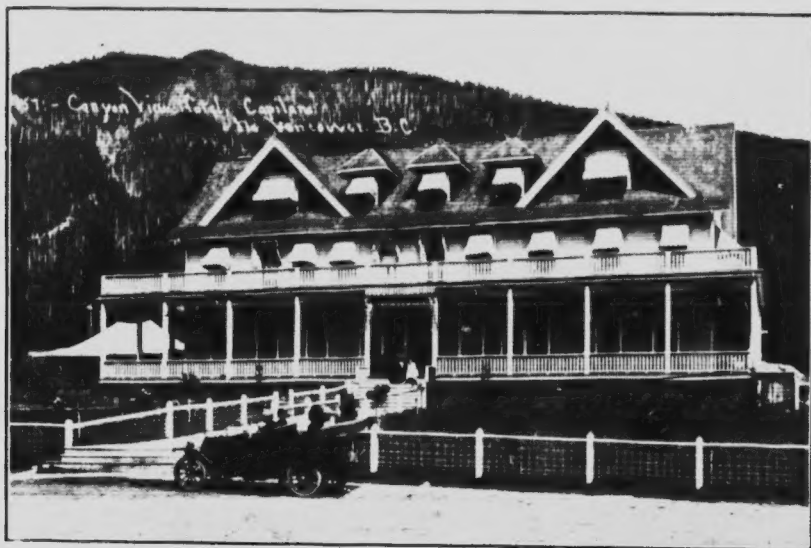
HR
G505
N6

PRICE TWENTY FIVE CENTS

PUBLISHED BY
THE BRITISH
COLUMBIA
MOUNTAINEERING
CLUB
VANCOUVER, B. C.
1913



TOURISTS come to the
"Canyon View Hotel"



Overlooking the famous Canyon on the Capilano River and nestling amidst fascinating scenery at an altitude of 630 feet.

Everybody will enjoy the wonderful air and surroundings; and capital fishing is to be obtained.

Mountaineers will be delighted by the unique scenery when ascending Grouse Mountain by the well-cut trail leading out of the Hotel grounds. Giant forest trees, waterfalls, high rocky cliffs and unexpected outlooks over sea and land to the south are amongst the rewards of the climber.

A splendid automobile road goes by the hotel doors and a service of comfortable cars runs from the end of the Electric Railway.

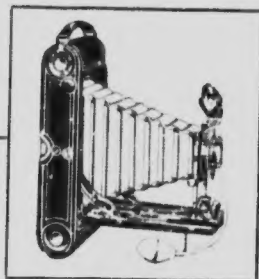
The Canyon View

THE PLACE for REST, for RECUPERATION and for PLEASURE

Rates \$2.50 to \$3.00 per day.

Patronize the advertisers and mention "The Northern Cordilleran."

THE KODAK HOUSE



CARRIES A FULL LINE OF THE
FAMOUS EASTMAN KODAKS,
PREMOS & GRAFLEX CAMERAS

Developing
Printing
Enlarging
Lantern Slides

Our Workroom
Staff is composed
of Professional
Photographers

Bishop & Christie

421 Granville Street

Phone Sey. 2085

Vancouver, B. C.

Patronize the advertisers and mention "The Northern Cordilleran."

"Hotel Capilano"



THE homelike comforts and the environment of this hotel make it an ideal place to bring your family in Spring or Summer.

Situate seven miles up the Capilano River, at an altitude of 950 feet, the air is pure and invigorating and the scenery unparalleled.

Mountain climbers desirous of ascending the Lions, or Crown Mountain, make the Hotel Capilano their headquarters; also fishermen and hunters start from here to indulge in the excellent sport to be found amongst the woods and streams.

Altogether the Hotel Capilano is an intimately homelike place to stay and the Mecca for everyone who is fond of the Real-Out-of-Doors. Drive right up to the hotel doors in your car any day or take advantage of the efficient automobile service from the end of the Electric Railway System.

*Rates \$2.50 to \$3.00 per day
or \$16.00 per week.*

*First-class
Diningroom*

Patronize the advertisers and mention "The Northern Cordilleran."

Offices: Suite 7,
107 Hastings St. W.

Phone:
Seymour 3699

BUCHANAN & CONNOR

Builders and Land Agents

VANCOUVER, B. C.

REFERENCES: UNION BANK OF CANADA (MAIN ST.)

Build HOMES to SUIT Purchasers.

SPECIALIZE in Pt. Grey Properties.

Know values and supply CONSERVATIVE estimates.

Courteous attention given to enquiries.



ERE CLOTHING is meant as covering. That is all it aims to be. That is all it usually is. PERRY CLOTHES begin where just clothing leaves off. They have style. They wear, too, because made of the best English woollens that come to this country. ~ Your business is solicited.

F. Perry

Labor Temple, Dunsmuir St.

Patronize the advertisers and mention "The Northern Cordillerian."

The Northern Cordilleran



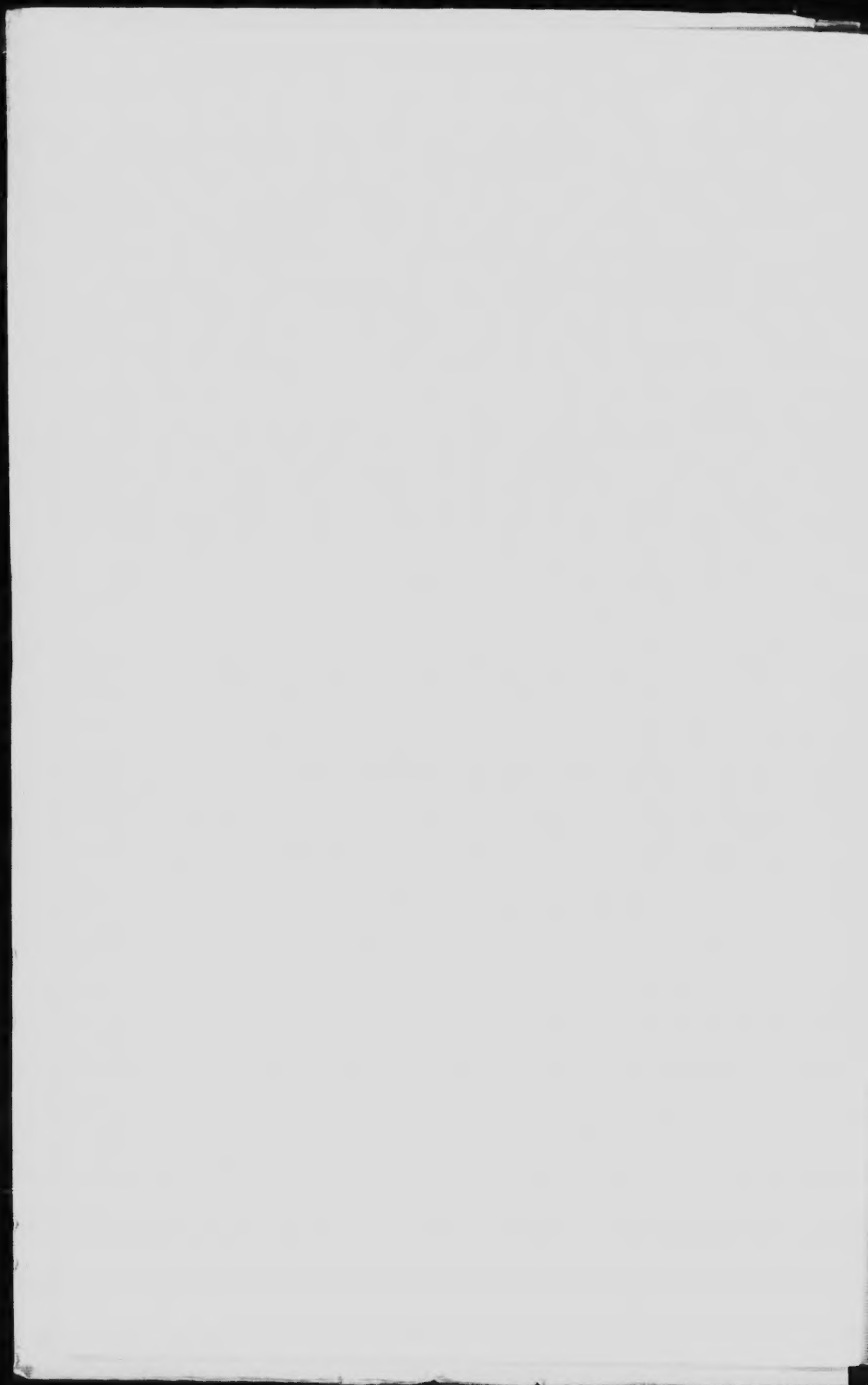
Mount Garibaldi from the East

PUBLISHED BY

The
British Columbia Mountaineering Club

1913

PRICE 25 CENTS







'They saw Garibaldi to the north' Page 15

Photo J. C. Bishop

Frontispiece

OFFICERS 1913-14

HONORARY PRESIDENT

J. C. BISHOP

PRESIDENT

WM. J. GRAY

VICE-PRESIDENTS

FRED PERRY

CHARLES CHAPMAN

SECRETARY-TREASURER

ROBERT T. THORBURN

ASSISTANT SECRETARY

P. J. PARK

EDITOR

J. PORTER, B.E.

LIBRARIAN

WM. TAYLOR

DIRECTOR

WM. J. GRAY

HONORARY MEMBERS

J. DAVIDSON, F.L.S., F.B.S.F.

J. PORTER, B.E.

EXECUTIVE COMMITTEE

W. G. BARKER

E. BURNS

HUGH SAMSON

MISS WILKINSON

MISS E. CARR

CABIN COMMITTEE

W. E. PARK

F. PERRY

ED. BELTZ

R. ADAMS

MISS E. B. FOWLER

PUBLICATION COMMITTEE

J. PORTER, B.E.

W. G. BARKER

WM. J. GRAY

CHARLES CHAPMAN

MEMBERSHIP 1913

Adam, W. H.	Fowler, Miss A.	McLeod,
Adamson, B.	Feast, P. C.	Odum, E. A.
Adams, R.	Gray, W. J.	Overlach, T.
Adler, P. M.	Goddard, Miss	Perry, F.
Anderson, Miss C. H.	Hawkins, B. G.	Park, W. E.
Burns, E.	Heaney, C. I.	Park, P. J.
Burns, Mrs. E.	Heaney, L. H.	Porter, J. (Hon.)
Barker, W. G.	Herbert, G. B.	Pearson, T. R.
Barker, Mrs. W. G.	Harman, R. W.	Powell, W. W.
Bridgman, Dr. E. W.	Hussey, C. P.	Robertson, D.
Bishop, J. C. (Hon.)	Harris, Miss E. M.	Rothwell, Miss G.
Boston, Miss P.	Imhoff, W.	Reeve, S.
Beltz, Ed.	Ingram, T. H.	Reffitt, J.
Badcock, Jas. L.	Jarrett, G.	Shellshear, T.
Creech, Miss M. M.	Korten, H. H.	Stevens, G. H.
Carr, Miss M.	Knight, R. E.	Stevens, F. J.
Carr, Miss E.	Lyon, R.	Samson, H.
Carr, J. P.	Laird, Miss A.	Shaw, Miss Helen
Carr, F. N.	Long, P.	Selwood, H. G.
Connor, D.	Loggie, Miss A. M.	Smith, Miss H.
Chapman, C.	Lane, E. H.	Speer, J. H.
Chambers, E. H.	Leggatt, N.	Selfe, H. M.
Coulter, Mrs. H. E.	Mills, R. M.	Taylor, Miss E.
Dickens, C.	Martin, C. F.	Tassell, W. H.
Davidson, J. (Hon.)	Morgan, E. I.	Taylor, W.
Drake, W. A.	Maher, W.	Turner, D. E.
Dyke, Miss P. M.	Martin, L. E.	Thorburn, R. T.
Edwards, G.	Madden, Miss E. L.	Wilkinson, Miss
Eckley, K.	Moore, W.	Wickwire, Miss M.
Fowler, Miss E. B.	Mattix, F. W.	Wiegand, Miss E.
	McKenzie, K. G.	

Membership Fee \$2.00 a year: Entrance Fee \$5.00, including first year's subscription.

Address communications to

P.O. Box 492

ROBERT T. THORBURN, Vancouver, B.C.

Historical Notice

The British Columbia Mountaineering Club, or, as it was originally called, the Vancouver Mountaineering Club, came into formal existence on Oct. 28th, 1907. For several years previously a number of enthusiasts had been making isolated efforts to explore the mountain region which lies to the north of Vancouver's great harbor. As they increased and became aware of one another's efforts, they saw the importance of forming a club to undertake the work more systematically. Early in October, 1907, Mr. George Jarrett, after consulting a number of friends, arranged an informal meeting at which Messrs. J. J. Trorey, H. B. Rowe, W. H. Tassell, and F. Lennox were present. A public meeting was then called for Oct. 28th, in the rooms of the Tourist Association. A committee was appointed at that meeting, under the chairmanship of Mr. Trorey, to draft a constitution and by-laws. These were adopted, and officers elected, at a general meeting held on November 18th. It was also decided that members joining before Dec. 31st, 1907, were to rank as charter members. The officers for the first year were as follows: President, Mr. J. C. Bishop; vice-presidents, Miss Laverock, Mr. G. Edwards; secretary, Mr. G. Jarrett; treasurer, Mr. A. D. King; editor, Mr. J. Porter, B.E.; committee, Miss Mitchell, Messrs. W. T. Dalton, W. N. Lailey, R. M. Mills, A. G. Ross, H. B. Rowe, R. S. Sherman, D.L.S., W. H. Tassell, J. J. Trorey, and W. T. Willet.

A chaste and artistic design for a crest was prepared and presented to the Club by Mr. A. E. Sherman. It is the one which has been in use ever since, and shows the best known and most climbed peaks near the city: The Lions, Crown, Goat, Dam and Grouse.

The first annual meeting of the Club was held on March 1st, 1908. This was followed by an illustrated public lecture on "Our Mountains," which was given by Mr. J. Porter, B.E.

Regular excursions were undertaken during the summer of that year. A number of smaller parties were organized for the purpose of exploring new territory. These pioneer trips led to the discovery of routes practicable for larger parties. The name of Mr. R. M. Mills deserves special prominence in this connection on account of the remarkable skill, enterprise, and talent for leadership he displayed. He was director of excursions during the earlier years of the society's existence; and the rapid extension in the range of its operations is mainly due to his unerring topographic instinct and skill in woodcraft. It was fortunate for the Club that, before he was compelled by the pressure of

business to withdraw from active duty, he had trained several of the members in his methods, of whom the most conspicuous are Mr. Gray, the present excursion director, and Mr. F. Perry, a disciple of Thoreau in his indifference to bad weather and his love of the woods.

The first recorded ascents of White Mountain, Seymour Mountain, and Loch Lomond Head were made on these pioneer trips. During this season the Club members also cut a new trail up Grouse Mountain.

The Club pennant was formally hoisted on Nov. 15th, by the president, Mr. J. C. Bishop, at the Capilano Hotel, under the shadow of the mountains which the society was to do so much to make known. A silver loving-cup was presented on that occasion to Mrs. D. W. Kells by the members.

The second public lecture was given on Dec. 2nd. The number of photographs in the possession of the members had been largely added to; and the area to be described had grown so extensive that the work was divided up between Messrs. J. C. Bishop, W. H. Tassell, R. M. Mills, and C. Chapman, who gave the addresses.

The second annual meeting of the Club was held on March 29th, 1909. The name was changed at this meeting to the present one. The most important of the pioneering trips which was made during the following summer was that of Mr. Bishop and Dr. Bridgman to Mount Garibaldi. It had been ascended for the first time two years before by Messrs. J. J. Trorey, A. T. Dalton, W. T. Dalton, T. Pattison, Atwell D. King and G. B. Warren.

The report of Messrs. Bishop and Bridgman led the Club to arrange for a summer camp there in the following year.

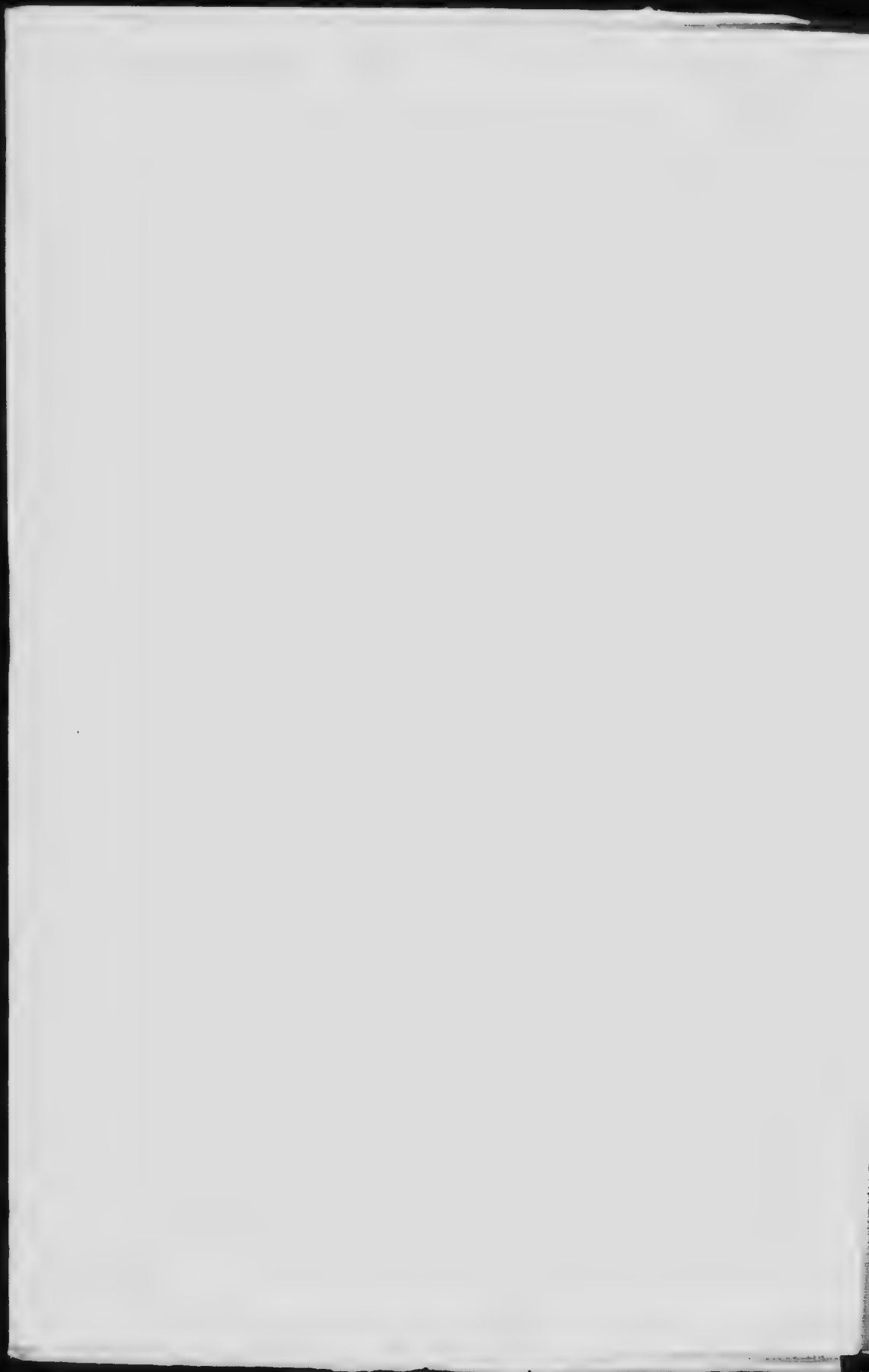
The members had begun to feel the necessity for a club-house within easy reach of the mountains during the second climbing season. It was impracticable to arrange for any winter trips which involved sleeping out overnight. A site of five acres was therefore secured on Grouse Mountain in January, 1910, and the work of building was begun soon afterwards. It was entirely completed by the members in their spare time. The club-house is now one of the society's best assets, having proved of the greatest value in maintaining the interest of the members and increasing their numbers. There is a large and well-furnished living room, and the kitchen department receives special attention. A separate building is provided for the lady members.

The club-house can be reached from the ordinary Grouse Mountain trail, a special trail having been cut to connect with it. The popular and very picturesque route between the Canyon View Hotel and the summit of Grouse, which passes close by the Club-house, was



Photo J. C. Bishop

On the Neve of Garibaldi Glacier



cut by Mr. Larsen in 1910. No one interested in local climbing can afford to miss an ascent of the mountain by this route.

The third annual meeting was held on March 31st, 1910. Mr. J. C. Bishop was elected honorary president and Dr. E. W. Bridgman president. The public lecture was given on March 23, the addresses being delivered by Messrs. J. C. Bishop, B. S. Darling, C. J. Heaney, and F. Perry.

The formal opening of the club-house took place on Feb. 11, 1911. The ceremony was performed by the honorary president, Mr. J. C. Bishop. A very successful dramatic performance was given in the evening, for which the piece was written by Messrs. F. Smith and C. Chapman.

The fourth annual meeting was held on March 20th, 1911. The summer camp was located in the same district as before. Several new peaks were climbed.

Two new sections of the Club, the Botanical and the Geological, were formed at a general meeting on Nov. 20th, 1911. The sections held frequent meetings for study during the ensuing winter months, the botanical classes being conducted by Mr. J. Davidson, F. L. S., Provincial Botanist, who entered most cordially into the whole scheme.

The fifth annual meeting was held on March 25th, 1912, when Mr. W. J. Gray was elected president. At this meeting the by-laws were revised, and an Entomological section formed.

The illustrated public lecture was given on April 12th, in which Mr. D. Connor gave the address on the Garibaldi region, Mr. Chapman taking the nearer mountains.

The summer camp of this season occupied a more northerly position than the previous ones. Much useful work was done by the new scientific sections, and Mr. Gray carried on plane-table and photographic work for the map of the district.

Mr. C. J. Heaney, B.C.L.S., who had been making very careful studies of the southern group of mountains for some years, completed a plane-table survey of them during this summer. It is with much pleasure that we publish the important contribution of Mr. Heaney to the topography of a district which was all but unopened at a very recent date. It is interesting to recall the fact that, even as late as the year 1906, an ascent of Mount Crown was looked upon by most people as a task of great difficulty. The first observation of camp fires on that mountain, which was made from the city of Vancouver, was given a very prominent position in the press.

It is only right that special mention should be made of the work of Mr. G. Jarrett in connection with the Club. He occupied the responsible

position of Secretary-Treasurer during the first five years of the Society's existence and conducted its affairs with a business ability and tact which led to general regret on his withdrawal from the office.

Two of the lady members, Miss Fowler and Miss Wickwire, have been constant in attendance and zealous in the work of the Club from the first. The presence of these two ladies in the group of self-sacrificing toilers on whom the chief burden always falls has greatly simplified the problem of administration.

The ladies had a very important duty to perform in looking after the comfort of the builders during the erection of the club-house. Amongst these ardent workers none were more prominent than Miss Hanafin and Miss De Beck. These two ladies and Miss Fowler have taken part in nearly all the arduous climbs of the district.

The strongest personal influence, which has smoothed the path of administration in the Club is that of Mr. J. C. Bishop. A true lover of the mountains, he has lent the prestige of his name and the dignity of his presence to the meetings; while he has brought the tact and charm of his kindly nature to bear on the task of making the excursions a success. There is no one whose services to the Club are more highly valued than his.

The Club is greatly indebted to its first Vice-President, Mr. George Edwards, for his indispensable aid in connection with the public lectures. The numerous photographs taken by the members have been utilised in the preparation of a full set of lantern slides numbering over 300, most of which were made by Mr. Edwards, whose fine lantern has been constantly made use of for their display.

The present is the first extended official publication of the Club. Many of the important excursions have been described unofficially in the local newspapers. Some of these notices were written by Mr. J. Porter, Mr. F. Smith, and Mr. B. S. Darling. The later ones were almost entirely prepared by Mr. C. Chapman. His ready pen did much, in conjunction with the illustrated lectures, to foster public interest in Vancouver's scenic heritage—a heritage unsurpassed and probably unrivalled by that of any other large city in the world. The task of making these mountains known has been a heavy one. Unstinted toil and unflagging perseverance have been called for; and the financial demands on the members have been heavy. With absolutely no aid from government or any outside quarter, they have carried on a work of great public importance from year to year, finding their reward in the doing of it.

J. P.

[The British Columbia Mountaineering Club has examined the region north, south and east of Garibaldi, having held its three summer camps there. A few hours in the steamer, and a few more in an auto, will soon be sufficient for the trip from Vancouver.

The main purpose of the following paper is to give some idea of Garibaldi, with its glaciers and snowfields and the neighboring summits. I have thrown my remarks into a form a little different from that of the other articles. For this I hope to have the indulgence of my readers.—J. C. B.]

A Romance of the Mountains

By J. C. BISHOP

Hon. President, British Columbia Mountaineering Club.

The early hours of a summer morning found Jack Langton and his pony leaving their home in the Squamish Valley. He was about to make the first trip of the season to his cabin among the foot-hills of Garibaldi, by way of Round Mountain and the Mamquam trail. While obtaining supplies at Brackendale, he received a letter, which proved to be of prime importance. Jack's nature was not unlike a mountain stream. He never lagged, but had to keep moving like the waters of the stream; and, like the stream plunging over a rock, his mind at once plunged into the possibilities which the letter opened up.

The first mile out of Brackendale is rather steep. A packer looks first to the set of his pack and the comfort of his four-footed friend, on whom so much depends. The attention which Jack had to give to these things confused his thoughts about the letter; so he decided to dismiss the subject till he reached his cabin.

For several years, he and two friends had spent their summer holidays in the Garibaldi region. He had built a cabin there, to which he was now on his way, in order to prepare for a visit from the Wards and their sister.

The lower portion of the trail led over Round Mountain. The great timber had been removed from the lower slopes; but some fine trees still remained. Trudging along the trail, his mind constantly reverted to the letter in his shirt pocket. But he loved the trail he knew so well, and determined to enjoy its beauties undisturbed by matters which would need his undivided attention.

It was mid-day before he and his pony emerged from the tall timber. They found themselves on a small plateau covered with stunted trees, thick grass, and moss, with black, silent pools. Masses of snow still showed here and there on the northern mountain slopes.

The dry warm bank of one of the creeks invited him to rest and lunch. A packer commonly loses but little time at mid-day. Jack could not, however, resist the subtle influence of the mountain spring time, or forego the enjoyment of the all-pervading fragrance with which the atmosphere was charged.

The swift passing of a deer startled the pony into action, which brought Jack to himself. He quickly set pack and was off again. As he passed under Lookout Mountain, one of the peaks of Round Mountain Ridge, he saw Garibaldi towering over the lesser heights. The trail curved like a well-drawn bow across the snow and the flanks of the ridge. To the left were great meadows sloping to the west; and a hundred streams drained them to the Little Mamquam. Columnar Mountain showed just across the meadows; and now Jack was looking at the brown spot on the high green slope where his cabin stood. Away to the right were Mud River and its well-wooded valley. Still farther off were the rock-cliffs of Mamquam, rising above its broad snow-fields and glaciers.

The trail now led into Green Valley, and, making a sharp turn to the east, brought Shadow Lakes into view. These two rock-basins, though not large, were beautifully situated. They were fringed with trees on the east and west; while the north was open, and mirrored the forms of Lava Mountain and Garibaldi. After crossing the valley, Jack made a turn to the west which completed the bow of the trail, up a steep slope which led to the door of his mountain home.

He swung the pack off his pony and rubbed it down vigorously with a bunch of dry grass. The animal needed no hobbling; it would come at his call. In a few minutes fires were burning on hearth and in stove, and the contents of the pack were all in place. He then attended to his own wants and sat down at the door to study his letter. It was a bulky epistle, bearing the post-mark of "Victoria, B. C.," and enclosing the official sanction of his most cherished scheme.

It was not strange that he forgot for a while the glory of the July sunset as he gazed into space, absorbed in thoughts of the future. The letter ran thus:—

"Dear Langton,—Your commission as Chief Ranger of the Garibaldi Reserve and Park, which I enclose, will be satisfactory to you, I hope. The authorities recognize that you are the man for the position. Your steady hammering at the subject, and the collection of photographs and sketch maps, which you placed in my hands last November, have convinced them of the importance of your suggestions, and led to their giving you what you have so long striven for.

and
Jack
ring
which

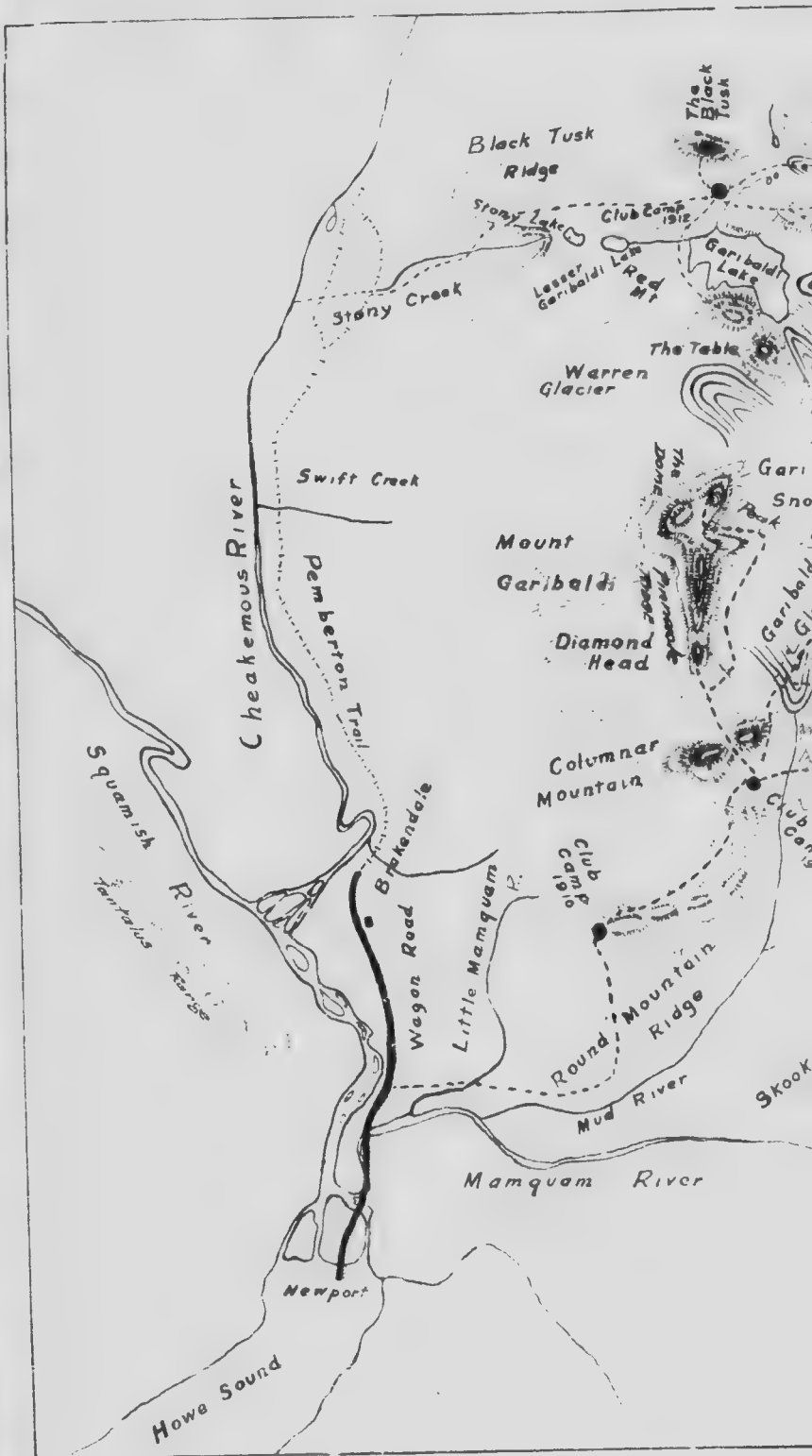
which
As
oun-
The
ks of
and
mnar
king
away
rther
ields

n to
sins.
with
the
lley,
l, up

ously
ould
d in
nded
was
en-

July
The

Gari-
u, I
tion.
aphs
have
heir





SKETCH MAP

SHEWING THE COUNTRY
EXPLORED FROM THE
CLUB CAMPS OF 1910-11-12

"The enclosed map, which has been prepared from your notes and sketches, covers almost the same ground as you suggested. The boundary of the Reserve takes in part of Round Mountain, that section of the Mud River Valley which you propose for a game preserve, the whole of Garibaldi and Mount Mamquam, and all those picturesque summits which surround Garibaldi Lake. The finest part of the district is thus secured against encroachment.

"I understand you are about to return to the Garibaldi region. Will you have a pony trail made to the Lake if possible? I wish to see these wonders for myself; but I must await the trail for I am not a mountaineer.

"You will doubtless submit some plans for further work. We can go over these together before drawing up a general scheme. I wish you every success.

"Yours sincerely,

"_____"

To Jack this letter carried with it many possibilities, of which he dreamed on that summer evening. These dreams were not all of park improvements. He had first to build an annex to his cabin. The cabin was convenient and comfortable, though made out of rough materials. But the annex had to be fit for the occupation of a queen.

The glory of the sunset broke suddenly upon him. Prismatic colors played on the gray mists above and turned the mountain tops to burnished gold, while the valley was flooded with rosy light. The picture held his gaze for so long that he seemed to lose his own identity. "No wonder," he thought, "that early man bent knee and head in worship of the sun." The chill of evening brought him back to earth. He re-entered the cabin, lighted his candle, and prepared for a good night's rest.

* * * * *

The morning mists lay thick over valley and meadow when Jack opened his cabin door. He lost no time in getting to work on the annex.

Its walls were built of flat slabs from the neighboring slopes, which were bedded in cut sods. His skill in woodcraft enabled him to make stools and chairs from gnarled tree-growths. But he did not stop there. He transplanted shrubs, heather and wild flowers to cover the traces of recent building; and the result was a masterpiece of ingenuity and fitness. It took just three days to complete. It was sheltered on the north by the south-east spur of Columnar Mountain. The front looked southwards, over Green Valley and the broad meadows. On the east

was Mamquam, from which the range of peaks continued southwards as far as Indian River. On the west a full view was obtained of the trail as it swept around from Lookout Mountain. It was a grand panorama. Meadows, streams, trees that told of winter storms, snowfields, ice-falls and towering peaks were all in sight from Jack's cabin door.

Everything was now ready for his guests, and the time for their arrival drew near. He pointed his glass at the lower end of the long curving trail. Yes, there they were, crossing the snow on this side of Lookout Mountain. George was leading; next came the two pack ponies, followed by Jean and Billy. But his eager interest in his visitors did not make him overlook the signs of a rainstorm approaching from the south-east. He caught up his camera and hurried down the trail as it swept around from Lookout Mountain. It was a grand panoupper Shadow Lake for a picture when the party should reach it. Farther on he met his old and tried friends with the warmest of greetings. Jean was full of delighted exclamations at the things she had seen on the way. "And, oh, Jack," she added, "I want to know everything about your Garibaldi. I am so glad mother let me come; for now I am to see it in all its wild grandeur!"

Jack pointed to the storm-clouds. But they held off until he had got his picture at the lakes. While descending into Green Valley, the rain came down. The storm passed quickly on its way to Mamquam, leaving the landscape fairer than before.

Jean was delighted with Jack's mountain home. He showed her into the annex. A roaring fire greeted her on her return to the living-room after changing her climbing dress. As she stood in front of it, she asked, "And did you really build that beautiful room in three days?" Presently she added, "Billy and I will get supper while you boys attend to the ponies."

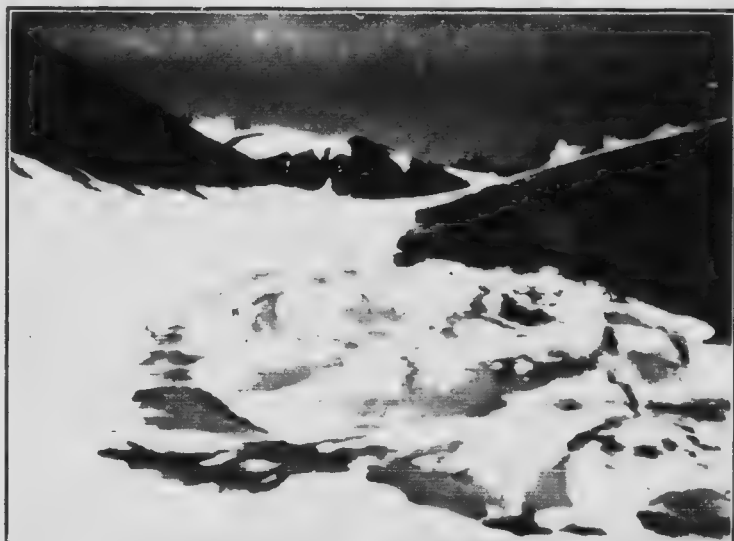
The evening passed merrily in front of the fire. They told of their adventures on the trail, and their troubles with a new pony that tried to stampede. Then came Jack's letter and the park scheme, on which the criticisms of George Ward were sound and practical. Soon afterwards the fresh young voices were heard in familiar songs, Billy accompanying on his violin. Then they all said "good-night."

It seemed but a few minutes later when Billy yelled "Good-morning!" It was glorious out of doors. Showers during the night had freshened the colors of the landscape, and clothed the valley in bloom.

The first task was the building of a bath-room over a pool a little below the cabin. Jean was greatly interested when she heard that there was to be a fireplace in it.



"The rugged crest-line of the Buttes"—Page 13



"A small lake of blue-green water"—Page

Photos J. C. Bishop

Facing Page 12

A trip up Lava Mountain was arranged, so that Jean might be shown the greater features of Garibaldi. They had an early lunch, after which they started northwards, and descended into Rock Valley. Piles of debris covered the slopes on the left; and broad scars on the flanks of Columnar Peak showed where all this material had come from. The murmur of water under the stones came pleasantly to their ears. In front of them lay a wide snow-slope. They crossed it, and gained the crest. From that they looked over into another world. Behind them were forest and meadow, in all the beauty of life and growth. Before them were the great silent snow-fields. The giant form of Garibaldi rose grim and clear against a background of blue sky.

Jack led the party eastward along a steep slope. Now on snow, now on rock, they passed the line of Lava Buttes, which stood out from the northern slope of Lava Peak as a group of pinnacles, whose grotesque forms contrasted with the regular outline of Columnar Mountain. When they had gained the top of the snowy dome of Lava Peak, he was able to point out the course for tomorrow, which was to lead them to the northern summit of Garibaldi.

As they worked round to the south-east they came to a gap in the rugged crest-line of the Buttes, where another transformation scene awaited them. It was a more extensive view than that from the cabin. Here a knife-edged spur of rock ran out from the ridge. Fifteen hundred feet below them was the upper end of Green Valley, smiling in the sunlight; while the muffled roar of Mud River came faintly through a still greater depth of air. The strain of the climb and the sudden change of view caused Jean to turn giddy. She trembled and clutched at Jack's arm. He guided her to a flat rock on which she could sit. Her brothers climbed out on the knife-edge to enjoy the sensation. As they crawled back, George called out, "Why, Jean, when the Mamquam road is built you will be leaving Vancouver in the morning to see the sunset from this spot!"

Jack noticed that her eyes were closed. He asked her what she was thinking of. "So long as I live, Jack," she replied, "I shall call to mind what I see today. I have been looking first at the living picture," she went on, "and then closing my eyes and developing it in the dark. I do not think there will be anything indistinct about that picture in my memory. And to think that all this grandeur lies so near the valley."

They made their way down by the south-western slope, and reached the cabin at three o'clock. Billy prepared tea and toast; after which they descended into Green Valley, and crossed a rolling meadow which

sloped, warm and bright, to face the sun. A new wonder met Jean; for it was spring-time here, and great masses of the spring anemone in bud and bloom were in full possession. On the knoll above the flower had run its course to ripened seed; but lower down, following up the receding snow, it was in the act of answering the summons of the sun. Jack promised a greater variety in two or three weeks.

George and Billie now pushed on in advance, Jean calling out to them that she was hungry and expected a good supper. Winding up Green Valley, she and Jack stopped many times to pick tempting blooms, while he gave her an occasional lift over broken ground. The two grew unmindful of all but the gladness within. They talked as they had done for years, looking into each other's eyes, in which nothing but frankness and truth appeared.

"We have been out but a few hours, Jack," she began, "but it seems impossible that I can have seen so much in so short a time. While looking down from that height, I felt as if I had travelled out over the ice and snow. Please don't laugh at me, Jack," she continued, "but I should like to write a story of what I have seen since I left the valley." "And your title would be?" "Yes, Jack, 'A Romance of the Mountains,'" she replied.

They were passing through a belt of open ground dotted with boulders, on one of which they sat down, looking over the meadows. Jack took her hand and asked, "Am I to be in your 'Romance of the Mountains,' Jean? We have drifted along to this from so many years past that I do not remember when we began. You know, Jean, that I love you; and I need you so much now. Am I to be in your Romance?" Her color deepened. He caught up the other hand; and as he turned her face towards him she looked up, and answered, "Yes, Jack, in my Romance through life."

They reached the cabin light-hearted; but they left their flowers behind. Billy had set a big vase in the centre of the table to receive them. "This is decoration night," he said; "something for you to remember, Sis." They had to hasten from the room to hide their blushes. As Jack went off to split the kindling wood, he whistled a few bars of "Away Down in Dixie" to prove that he was thinking of nothing in particular.

Such a supper, and such an evening! But George and Billy furnished most of the merriment. Jean and Jack were rather quiet. Their sweet little secret would be all their own for a time. At last the party got up to prepare for the long trip of next day. Everything was laid out in

order on the side table; and Billy remarked, "Early to bed, for early we rise."

• • • • •

Billy awoke, and considerably gave the others a grace of half an hour while he got breakfast. He believed in the mountain maxim, "Never hurry in the morning." At last they were ready to start.

The dawn showed the mists covering Green Valley and the lower slopes. The course lay northwards over the ridge they had climbed yesterday. They descended to a wide snowfield, over which towered the Lava Buttes, whose dark and rugged forms stood out against the sky.

They passed a small lake of blue-green water, set like a gem in the pure white of the snow. The sun was now breaking through the mists; so the blue glasses and veils were adjusted.

The party had to make its way up a steep slope of ice, which brought the sturdy axes into play. The rising sun was chasing the vapours away, and disclosing a far-extended and ever-changing picture of forest and river-valley to the south-west, thousands of feet below. They reached Diamond Head, and saw Garibaldi immediately to the north, a sharp arete connecting the two. The western slope from the arete was composed of loose volcanic ash and boulders in a state of constant slide; while the eastern slope of snow reached upwards almost to the narrow crest. They way to Garibaldi lay across the snow. They descended until they reached a small bluff which rose above the eastern slope. A well-marked snow cornice ran all along the top of the bluff. They were able, however, to break a hole through it at one place, through which Jack lowered the others by means of the rope. They stood aside to leave a clear space where he could land on the loose ash. He made the drop without difficulty; and the party, turning northwards, ascended the snow-slope diagonally.

They had travelled more than a mile in this way, when they were confronted with a steep pitch of loose material, running out to the eastward from the main mass of Garibaldi. Here they had to use the rope. A wide snow-field opened to their view as they reached the top. On the left was the dark forbidding east wall of Garibaldi. Nothing else was to be seen. A solemn stillness invested the place as they wound among crevasses and over a snow bridge. The view broadened out again as they came in sight of a well-marked bergschrund, where a change in the slope of the mountain side maintained a great crack in the ice, which was weathered to a fluted and broken wall.

At last they reached a projecting spur, where an ice-fall was giving rise to wonderful forms. This was the end of their climb. Shadows of

floating clouds were playing over the landscape of ice and rock, on which was thrown the gigantic shadow of the mountain. Jack swept his hand over the unforgettable picture with a dramatic flourish. "The North Garibaldi Park," he said. He then pointed out to Jean the leading features of the park.

The irregular outline of Garibaldi Lake showed four thousand feet below them, nearly four miles away. Far to the left was Warren glacier, the largest of the group. To the east of the lake were Sentinel Ridge and Glacier, and the Sphinx snow-field and its glacier; while on the north was Black Tusk Ridge overshadowing its meadows, the latter wide enough to afford camping-ground for an army.

George and Jack were discussing the route of the trail to the lake, when Jack's sensitive ear caught a warning murmur from the south-east. He at once gave the word to return. Jean reluctantly turned her gaze from the smiling valley and lakes back to the chilly snow-field over which they had come. But she remembered the green fields and snug cabin below, and rose lightly.

Jack was too much a master of the art of walking to start the party off hurriedly. They began the descent with caution, making only safe glissades. Soon, however, they warmed up, and were doing quick time as they flew over the snow, with Jack well in the lead to choose the way among the crevasses. When they came again to the eastern spur, he could not resist the temptation to stop and point out the beauty of "the finest glacier in the Park," whose broad form extended for seven miles to the southward. At the foot of the slope they found themselves on a "dry glacier," where new conditions were evident. They did not attempt to return by the snow cornice; for Jack decided to follow a safer course down Mud River Glacier. The long hours of sunshine had created an icy stream, which came down in merry splash on their left. Suddenly a strange noise made Jean look up. "That," said Jack, "is the gulp of the moulin, where the surface water is rushing into a sink-hole, and carrying air with it, which gurgles back again. Bend low and listen." She did so, and cried, "Why, Jack, it seems alive." "Yes," he replied; "a dry glacier is a strange thing."

They resumed their descent towards Mud River with a winding moraine ridge of stones and earth on their right. As they neared Lava Mountain they made for the eastern rock-slide, which they ascended obliquely. They stopped to rest; but the eyes of George and Jack were on the white mist in the Mud River Valley, and they could see it creeping upwards. They were more than two miles from the cabin, which lay on the other side of Lava Mountain; and the way was crossed by

n which
his hand
North
ling fea-

and teet
glacier,
ridge and
the north
er wide

the lake.
outh-east.
her gaze
er which
cabin be-

the party
only safe
quick time
the way
spur, he
y of "the
ven miles
lves on a
d not at
w a safer
mine had
their left.
Jack, "is
o a sink-
low and
"Yes," he

winding
red Lava
ascended
ack were
it creep
in, which
crossed by



A wide snow field opened to the north. Page 15



To choose the way among the craggy rocks. Page 16

J. C. Bishop

Facing Page 16

torrent tracks and rock-slides. The mist would be upon them in a few minutes. Jack explained their situation to Jean. "Well, boys," she said "I am going to see another phase of the mountains; but I am safe with you."

Down they scrambled in haste, through snow-banks, oozy ground, and tangled growths, the white streamers swirling around them. As they reached a narrow valley, Jack plunged ahead to scout, guiding them with his voice. The one thing he feared was the treacherous crust of snow above the hidden streams in the valley. But they got across in safety.

The mist was thick when they got to Rock Valley. George and Jack scouted in opposite directions, while the others stood still. At last Jack called out, "The ridge!" In a few minutes they were safe inside the stout walls of the cabin. But the strain had been great; and Jean collapsed as soon as it was removed. A blazing fire and a cup of tea soon brought back her color. They were all glad, however, to try Jack's prescription of hot water and clean clothes.

As they sat at supper amid the brightness and comfort of the cabin, they talked with animation of the day's experience and the storm-warning. Jean looked at Jack, and said, "You have learned to know the mountains and to read their secrets. Do they always tell you of their storms?" "Yes, Jean," he replied; "Nature never plays false."

The wind began to whistle around the cabin, and rain was soon pattering on the roof. Jean rose. "Good-night, boys," she said. Billy impulsively kissed her. "One for mother and one for myself. Good-night, Jean," he said.

* * * * *

The sun had been up for some hours before the cabin showed signs of life.

The events of yesterday were talked over at breakfast. The conversation was continued in the garden, where Jack had planted roots and seeds of the mountain flowers; and there they discussed their next move. Work was Jack's greatest delight, and he felt that he must get to it at once. His alert mind was already engaged with the construction of the first permanent road into Garibaldi Park. So it was decided to give the rest of the day to the gathering of flowers and resting, so that they could all start for the Squamish Valley in the morning. Jack and Jean made their way to the big rock near the meadows, where they retrieved some withered blossoms, now more prized by both than the fairest products of the gardener's art.

And thus began a "Romance of the Mountains," which we leave to run its course amid the beauty and sublimity of Nature all untouched.

THE NORTHERN CORDILLERAN

The following table shows the depth of snow on Grouse Mountain which has been recorded during the past two winters.

Club House. Height above sea-level 2,200 ft.		Plateau of Grouse Mt. Height above sea-level, 3,800 ft.		Summit of Grouse Mt. Height above sea-level, 4,200 ft.	
Date	Depth of snow ft. in.	Date	Depth of snow ft. in.	Date	Depth of snow ft. in.
1911.		1911.		1911.	
Nov. 12.....	3	Nov. 19.....	3	Nov. 19.....	3
Dec. 24.....	2	Dec. 24.....	6	Dec. 24.....	6
1912.		1912.		1912.	
Jan. 7.....	2 6	Jan. 7.....	8 6	Jan. 7.....	9
Jan. 14.....	2	Jan. 21.....	8 6	Jan. 21.....	9
Jan. 21.....	1 6	Feb. 18.....	10	Feb. 18.....	11 3
Jan. 25.....	1	Feb. 25.....	11	April 14.....	10
Feb. 23.....	5	Mar. 10.....	11	May 12.....	9
Mar. 9.....	0	April 14.....	9		
Mar. 16.....	5	May 12.....	7		
1912.				1912.	
Dec. 1.....	6			Oct. 29.....	1
Dec. 8.....	3			Dec. 1.....	5
Dec. 22.....	1			Dec. 8.....	6
Dec. 29.....	3			1913.	
1913.				Jan. 5.....	13
Jan. 5.....	3 6			Jan. 11.....	15
Jan. 11.....	4 6			Jan. 26.....	19
Jan. 19.....	5			Feb. 23.....	18
Feb. 23.....	4			Apr. 13.....	20
Mar. 9.....	3				
Mar. 16.....	2 6				
Mar. 23.....	2 9				
Mar. 30.....	3 6				
Apr. 6.....	2 6				
Apr. 13 patches.....	1				

The Topography of the Vancouver or Britannia Range

By C. J. HEANES, B. C. L. L.

The object of this article is to describe those mountains which lie to the north of Burrard Inlet, immediately behind the city of North Vancouver. They are described on the maps as the Britannia or Vancouver Range; but the various peaks are known to mountaineers by special and familiar names.

The country covered during the season by the week-end excursions of the British Columbia Mountaineering Club lies roughly between Howe Sound on the west and the North Arm of Burrard Inlet on the east, and between a line joining the peaks of Mounts Brunswick and Bishop on the north and Burrard Inlet on the south. This area is divided into four sections by the Capilano, Lynn, and Seymour streams. Each of these sections contains peaks enough to make it interesting to the climber.

The positions and heights of the more important peaks are shown upon the accompanying map. In the work a simple plane table was used, much of the detail being filled in from photographs taken by members of the club. The heights given are the average of readings taken at different times of the year with a pocket aneroid.

The nearest mountain to Vancouver is Grouse. This is undoubtedly the most climbed mountain in B. C. On its western slope the Club-house is situated at an altitude of 2,300 feet above sea level. The plateau of Grouse is about five miles from the ferry landing on the north shore of Burrard Inlet, and has an elevation of 3,800 feet. It lies below the timber line; but numberless parties of campers have succeeded in burning up every tree within a hundred yards of the edge which overlooks Capilano valley.

From this point the panorama is very extensive, embracing many square miles of land and sea. In the foreground the harbor and city of Vancouver are spread out like a huge map. The picture is beautifully outlined after dark by the myriad points of light along the streets. Mount Baker, in the State of Washington, rises to the south-east. It looks only twenty or thirty miles away instead of eighty, because the flat lands of the Fraser delta occupy the middle distance. To the south lie the island-studded waters of the Straits of Georgia; whilst in the distance the snow-capped peaks of the Olympic Range are visible unless the atmosphere is very hazy. The snow-filled cone of Mount Rainier

THE NORTHERN CORDILLERAN

is seen in exceptionally clear weather, some 180 miles away. To the west, across the Capilano valley, are the wooded slopes of the Hollyburn Ridge and Black Mountain, which are rather uninteresting to the climber.

The plateau of Grouse extends in a northerly direction for about half a mile to the foot of the peak, which rises sharply for another 400 feet. The top of the peak is rocky, but is not without vegetation, being sparsely clothed with stunted trees and heather.

Half a mile to the south-west of the peak lies a small shallow lake. This is fed by the melting snow in the spring, and receives its supplies during the summer by drainage from the western portion of the plateau.

To the east of the plateau, on the other side of the deep ravine of Mosquito Creek, is a rounded eminence known as The Dome. This is seldom visited, as it presents no difficulties to the mountaineer, and the view from the top is neither beautiful nor extensive.

The peak of Dam is the highest point of a ridge about a mile in length, running east and west. Its altitude is 4,500 feet. It effectually masks the northern view from the peak of Grouse, which is about 300 feet lower. The two are connected by a narrow saddle or divide, five hundred feet lower than Grouse.

On the west the ridge of Dam falls abruptly to Crown Creek, a tributary of the Capilano; whilst on the east it slopes gradually down to the Lynn Creek valley.

A low ridge connects Dam and Goat, to the east of which lies a small lake. On the west of the ridge is Crown Creek, which bears nearly south-west. At a distance of about half a mile along the ridge is Goat Peak, a huge truncated cone of granite rising precipitously on the west and north sides, but easily accessible on the south and east. From the peak the ridge of Goat continues to the north-east, terminating abruptly in a broken granite wall which overlooks Lynn Creek. Goat is higher than Dam, having an altitude of 4,700 feet, and commands a striking view of Crown Mountain and the great stone-shoot on its eastern face. This stone-shoot is known as "The Crater," a very misleading term, as the mountains in this locality are not volcanic, but granitic. From this point, too, the remarkable mass of rock beside the summit of Crown which is known as the "Camel," is seen to advantage. The name has more justification than is sometimes found in such cases. To reach the summit of Crown from this side it is necessary to descend into the valley of Crown Creek from the saddle between Dam and Goat. As the descent is very steep, care must be exercised. But

To the
Holly-
ing to

about
another
etation,

shallow
ives its
tion of

vine of
This
er, and

mile in
ectually
about
divide,

Creek, a
y down

h lies a
h bears
e ridge
usly on
nd east.
termin-
Creek.
nd com-
ne-shoot
' a very
nic, but
side the
advan-
in such
essary to
en Dam
d. But

l

e

f

t

r

e

z

j

e

u

v

l

e

u

v

e

-

t

l

e

s

t

s

u

o

s

l

-

f

l

u

o

l

s

u

-

t

o

To the
of the Holly
mountain to

for about
for another
vegetation

is a small shallow
and it gives its
portion of

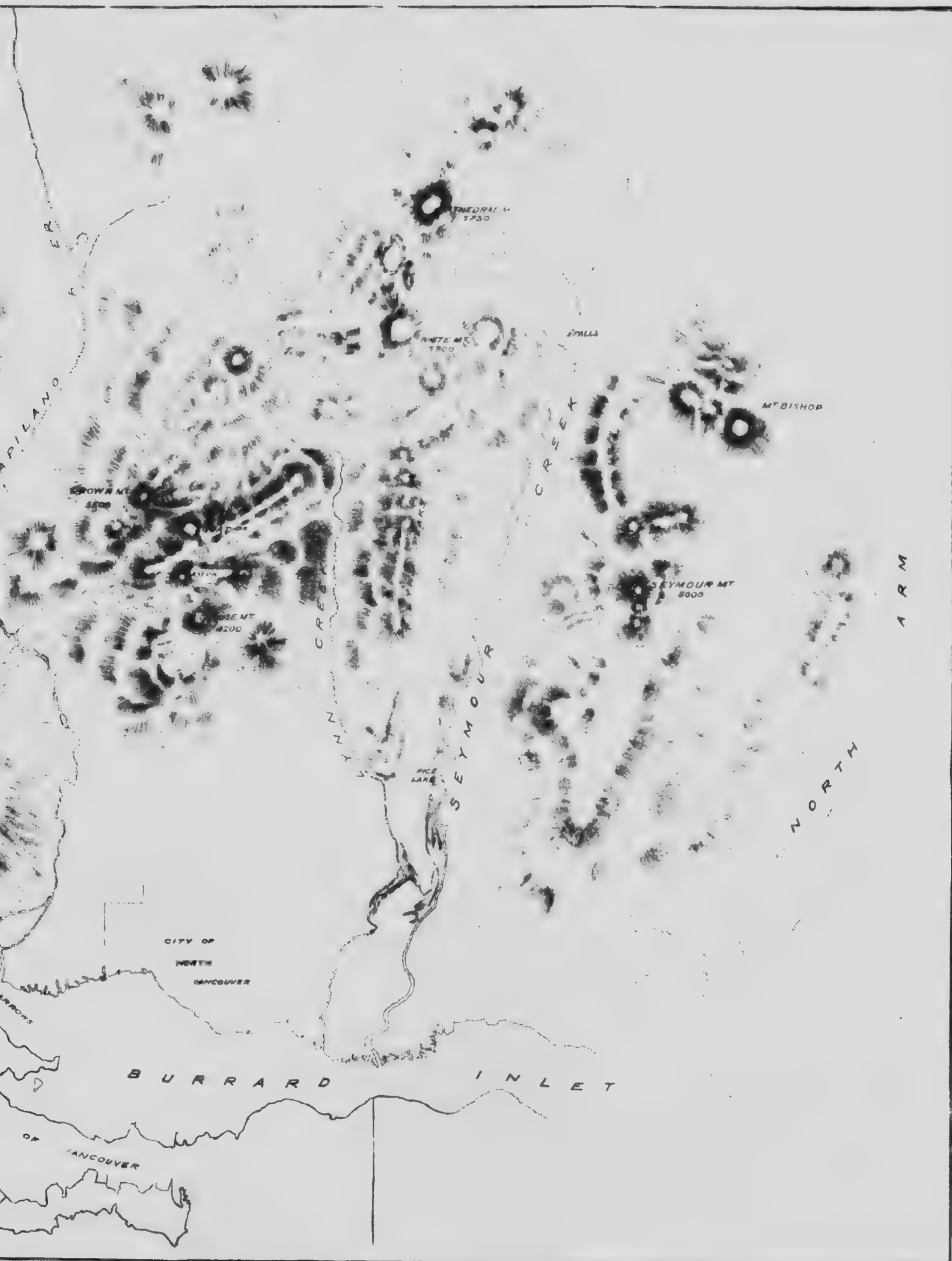
at the deep ravine of
known as The Dome. This
to the mountaineer, and
not extensive

is a ridge about a mile in
4500 feet. It effectually
Grove, which is about
narrow saddle or divide.

at the mouth of the
the extent of the slope gradually down

Crown Creek, which bears
the ridge
precipitously on
north and east
to the northeast, termin-
Lynn Creek,
4700 feet, and com-
the great stone-shoot
known as "The Crater," a very
are not volcanic, but
marked mass of rock beside the
Cane is seen to advan-
sometimes found in such
from this side it is necessary to
from the saddle between Dam
are must be exercised. But





is
we
bur
the

hel
400
bei

lak
sup
the

Me
is
the

len
ma
300
five

tril
to

sm.
nea
is
the
Fr
ati
Go
ma
on
mis
gra
sur
tag
cas
des
anc

in the subsequent ascent from the creek to the summit of Crown there are no obstacles of importance.

The summit of Crowr Mountain, altitude 5,500 feet, consists of a knife-edge of granite, which is being rapidly eroded by the elements. To the north of it is the kneeling Camel, which has a slightly lower elevation than the peak.

In the fall of 1909 some adventurous spirits of the Club made the traverse along the precipices from the peak, and succeeded in scaling the hump of the Camel, a feat which until then had been considered impossible. The members of the climbing party on that occasion were Messrs. Hewton, Mills, Lyttleton, and Miskin. The Camel has been climbed on several subsequent occasions; but Miss De Beck is the only lady who has gained the top. The animal's head was not climbed until the next year.

Crown Mountain is the highest point in the group between the Capilano River and Lynn Creek, and is also the most interesting from a climber's point of view. The western slopes, which rise gradually from the Capilano River, are heavily timbered, becoming steeper as the altitude increases, until near the western peak they are almost perpendicular. The western peak is reached at an altitude of 5,000 feet. It is separated from the main summit by a divide, which contains a small shallow lake. This becomes dry during very hot seasons. A ridge extends from Crown to White Mountain on the north-east, and forms the northern boundary of the drainage basin of Lynn Creek. The crest of this ridge is very rugged at the end next to Crown. It becomes rounded and well timbered as it continues eastward.

To the east of the Grouse group of mountains, between the Lynn and Seymour Creeks, a low serrated ridge runs due south from two very prominent peaks, White and Cathedral Mountains, the altitudes of which are 5,200 feet and 5,800 feet, respectively. The southward ridge, which has an altitude of 3,500 feet, is totally different in character from the surrounding groups, the granite giving place to rocks of a metalliferous character, several copper claims having been located there. Up to the present, however, they have not been worked with any measure of success.

The rocks again become granitic to the north of the point where the east fork of Lynn joins the main creek, rising into the splendid massif of White Mountain. The name White is very appropriate, as the whole summit of the mountain is a weathered granite plateau, which in summer has almost the appearance of a snowfield. It is very extensive, being about three-quarters of a mile across, rising to its greatest altitude at the north-west corner, where it terminates in a knoll, the

sloping sides of which extend down on the north to the saddle by which it is connected to Cathedral. On the western flank the mountain is precipitous. It forms one side of the huge amphitheatre within which Lynn Creek rises. On the east lies the valley of Seymour Creek, overlooked by precipices which are scarred by deep gulches, down which the snows of the summit plateau discharge themselves in torrents during the melting of spring.

To the north-east and north-west, respectively, of White Mountain are two lakes, one on each side of the saddle connecting it to Cathedral. That on the north-west drains into the Capilano by a creek which flows round the northerly boundary of the Lynn Creek watershed; while that on the north-east drains into Seymour Creek.

Owing to the inland position of Cathedral Mountain, the views obtained from it are not so striking as those from the summits nearer to the sea. Its isolated position makes it useful, however, as a topographical station.

To the north the country consists of a series of wooded ridges. Beyond these ridges are the Sawtooth Range and the huge icefields of Garibaldi and Mamquam, which form a wall that screens from sight the country further north. The district immediately to the north of Cathedral has been partially explored by several parties of mountaineers; but the time required to traverse it prevents its being included in any week-end trip.

As mentioned earlier in this article, there are two other groups of mountains which are frequently visited. These are the Seymour group and the mountains to the west of the Capilano River. Seymour Mountain, whose altitude is 5,000 feet, is the most southerly peak in the first group, and is the culminating point of a ridge which rises steadily from Burrard Inlet. It is easily accessible from every side, but is usually ascended from the west. This route necessitates the fording of Seymour Creek, whose waters are too cold to be pleasant at any period of the year. For this reason the mountain is not visited as often as its interest would warrant.

Running in a northerly direction, and connecting with Mount Bishop (altitude 4,800 feet), is a broken ridge which falls away to the east to the North Arm of Burrard Inlet.

From the summit of Seymour a clear view is obtained of all the peaks mentioned in this article. To the north-east is a country of great extent, which is practically unexplored, stretching from the North Arm of the Inlet to Pitt Lake. Trips have been made at various times in this region; but they have been unsuccessful on account of bad weather.

by which
mountain is
in which
peak, over-
in which
torrents

Mount-
to Cath-
a creek
k water-

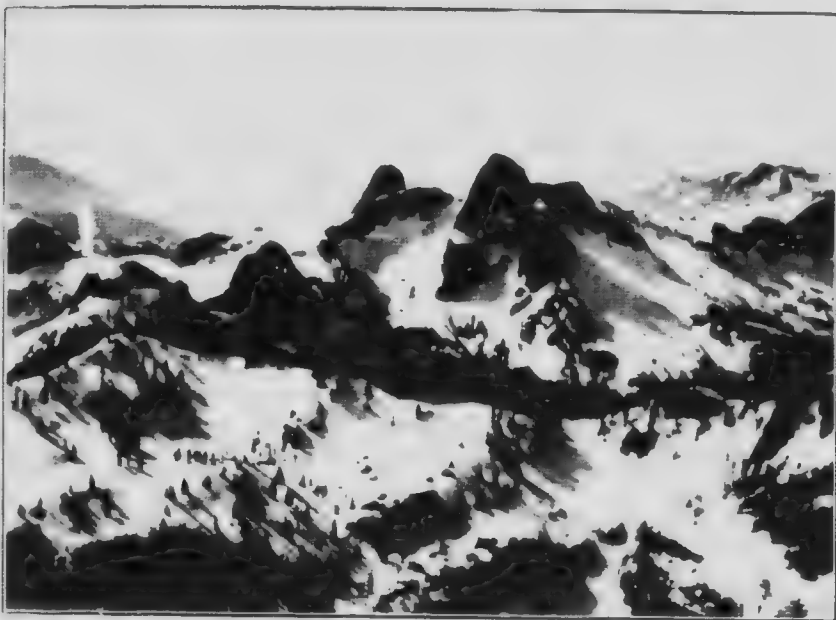
he views
ts nearer
s a topo-

d ridges.
efields of
om sight
north of
mountain-
cluded in

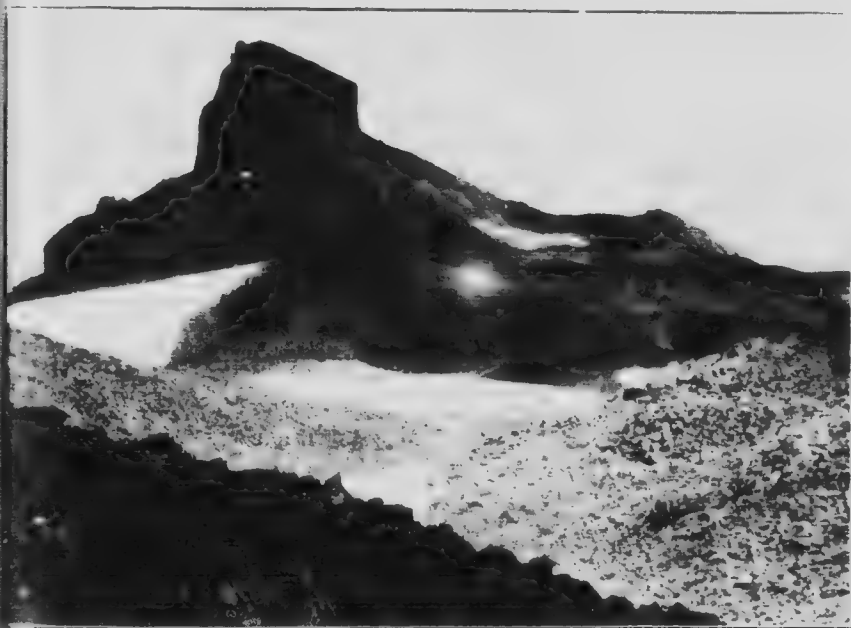
er groups
Seymour
Seymour
y peak in
which rises
y side, but
he fording
nt at any
d as often

h Mount
s away on

of all the
ry of great
North Arm
times into
d weather.



Peaks from Mount Brinsford



S. H. J. Gray

Black Peak

Facing Page 22

Having now dealt with the three groups most often visited by the Club, there remains only that group which is bounded by the Capilano River on the east, and by Howe Sound on the west. Its principal peaks are Black Mountain, Mount Strachan, "The Lions," and Mount Brunswick. Black Mountain is the most southerly of these, and is easily climbed from any direction. The chief difficulty arises from the heavy timber and wind-falls which encumber its slopes. The usual route follows Cypress Creek from the Keith Road to a point above the canyon and falls. The creek is crossed above these, and the way leads over a low ridge and down into a glen, through which runs a small creek whose outlet is at Eagle Harbor. From this point there is a steady ascent, broken only by small watercourses, until the summit ridge is reached. The timber on the ridge has been completely destroyed by fire.

Hollyburn Ridge rises between Black Mountain and the Capilano River, stretching from the waters of the Inlet on the south to Mount Strachan on the north. This district was visited during the past season by a party of the botanical section of the Club, in charge of Mr. J. Davidson, F.L.S., when a valuable collection of the flora was made.

The valley bottoms in this vicinity are marshy in character. This is especially the case immediately to the north of Black Mountain, a muskeg of considerable size covering the whole floor of the valley, and having the appearance of a lake overgrown with weeds when viewed from a height.

Slightly to the north-east of Black is Mount Strachan. Its top is gently rounded, well timbered, and covered with underbrush. The peak proper rises at the north-west extremity of the mountain, overlooking Sisters Creek, a tributary of the Capilano, on which side it is very precipitous.

Before leaving these peaks, it may be well to state that although they rise gradually from the Capilano, they present a very rugged appearance when viewed from Howe Sound.

From Strachan the mountains increase in height until the Lions are reached. These remarkable masses of granite are the most conspicuous peaks to be seen from the city of Vancouver. They have been the objective of many hard trips and interesting climbs by the Club.

The eastern Lion is usually climbed from the north-west side, and the western Lion from a small gully which cuts into the ridge extending northwards from Strachan. Although this feat is by no means a difficult one, it is not without danger, and should not be attempted by a beginner.

As might be expected, the views from the heads of the Lions are very extensive; that from the western Lion embracing Howe Sound

with its many islands, and the mountain region to the west and north west.

From the eastern Lion, if the weather is clear, the city of Vancouver may be seen through the wide gap which has been formed by Sisters Creek and the Capilano River.

To the north of the Lions, and separated from them by rugged ridges, are Mounts Brunswick and Hanover, of which only the former will be touched upon here.

Mount Brunswick is higher than either of the Lions, besides differing from them greatly in structure. They are typical granite mountains, while Brunswick is slaty in character. As the trip from the Lions to Brunswick is over such rough country, the ascent is more easily made from the shores of Howe Sound. From this side the mountain presents no difficulties, the climb being merely a long uphill walk through the woods. The summit consists of a sharp ridge of weathered slate, with an easterly trend. It falls away to an open valley on the south, and on the north to a narrower one, upon the other side of which rises Mount Hanover.

The country to the north of Hanover has not been surveyed, but when an opportunity offers this will be undertaken, making with the work already performed by Mr. W. Gray in the Garibaldi district, a complete mountaineer's map of the country between the Squamish River and Burrard Inlet.

In closing, I wish to thank Mr. Gray and the other members of the British Columbia Mountaineering Club who have, by photographs and otherwise, so kindly assisted me in this work.

"Mere change of scene and active exercise produce fatigue at last, unless the mind have some wholesome employment as well as the body; and most of those who have made the trial will probably regard as amongst the happiest periods of their lives those in which a favourite study has been pursued in the retirement of mountain scenery."—Forbes' *"Travels Through the Alps."*

The Garibaldi Group

BY W. J. GRAY AND H. SAMSON

Looking up the Squamish Valley from Newport Landing, a number of long, sloping, heavily timbered ridges can be seen extending eastwards to a huge ash-coloured pyramid that rises to a height of 8,700 feet above sea level. The pyramid is known as Garibaldi, which is believed to be the highest mountain in the district. Lying behind it are the ice-fields and ranges which the Club has endeavored to explore during its three summer camping seasons. It is the object of this article to present some of the geographical information obtained from the camps.

The Garibaldi group of mountains may be provisionally described as bounded on the east by the Upper Pitt River, on the south by the Mamquam River, on the west by the Cheakemous River and on the north by the north branch of the same river. It must not be interred, however, that this district is markedly isolated in character; it is merely a division of the alpine country which extends east from the Squamish and Cheakemous Rivers to the Harrison and Lillooet Rivers and Lakes. Up to the present only the Garibaldi group has been explored by the Club.

A general view of this region is obtainable from the summit of Garibaldi. The main features are indicated on the accompanying map. From west to southwest the timbered ridges mentioned in the beginning of this article extend outwards, separating the numerous tributaries of the Cheakemous River. Below them the Squamish and Cheakemous Valleys stretch southwards to Howe Sound. Still further west the rugged Tantalus range stands sheer up from the Squamish Valley, its line of peaks showing a northwest trend. To the east and southeast a series of heavily timbered ridges of volcanic rock slope towards the Mamquam River, which flows westwards to join the Squamish. Beyond these ridges, further to the east, the spurs of Mamquam stand out, terminating in a row of rugged crags, which forms the western boundary of a large basin-like snowfield. To the north and east lies the immense Garibaldi snowfield, out of which at least six glaciers issue—the Garibaldi, Lava, Pyramid, Pitt, Sentinel and Warren Glaciers.

The Garibaldi and Lava Glaciers issue from the south side of the snowfield, sending their muddy waters through the timbered volcanic belt to the Mamquam River. On the east the snowfield reaches to the Pyramid, which forms the northern extremity of the Mamquam Range. Pyramid Glacier issues in a northeasterly direction, occupying the upper

portion of a deep canyon-like valley, which curves around the east side of Mamquam and joins the valley of the upper Pitt River.

Immediately to the north of Mount Garibaldi, and directly below its lofty northern face, the Warren Glacier flows towards the Cheakemous River. The valley is thickly covered with moraine debris for a long distance below the present snout. This glacier is doubtless the source of Swift Creek. Still further north lie the blue waters of Garibaldi Lake. The Black Tusk ridge extends along its northern shore, and continues with a gradual fall westwards to the Cheakemous Valley. On its highest part, immediately north of the lake, stands the bold, isolated peak called the Black Tusk. Sentinel Ridge rises from the east side of the lake to a snowy crest. Its eastern slope drops to a valley which drains to the Pitt River. Still further off to the northeast rise Copper Peak and Castle Towers. These two are connected by the Battlements, a ridge of granite about a mile long, which rises like a broken wall out of the snow-filled amphitheatre down which the Sphinx Glacier flows to the lake.

The Club's first introduction to this magnificent district was in July, 1910, when the first summer camp was held. The members were not a little surprised to find the district so distinctly alpine in character. The first and second camps were held on Round Mountain Ridge, which separates the Mamquam and Little Mamquam Rivers, and extends in a long curve to Columnar Mountain, immediately south of Garibaldi. The first camp was situated on the western end of the ridge, about three miles from Columnar Mountain, overlooking the Squamish Valley, the altitude being about 4,400 feet. This camp did not afford good opportunities for exploration, and but little work of importance was accomplished. The camp of the following year was pitched directly below Columnar Mountain, within two miles of the Garibaldi snowfield.

Provisions were transported from Vancouver to Newport by steamer, and from thence by pack-horses up to the western end of Round Mountain Ridge, where they were cached until the arrival of the party, which had to carry them the remaining three miles to the camp. The party left Vancouver on August 6th, and reached the camp on the 8th, and on the following day arrangements were made for the first excursion to Mamquam. During the previous season this mountain had excited the admiration of all. Two weeks before the second camp a party of six Club members had made the first ascent. They had reached the mountain by crossing the upper part of Lava Glacier. But the main party decided to try a new and apparently shorter route across the timbered volcanic ridges. With three days' provisions they descended first to the Mud River, which rises in the Garibaldi Glacier and flows

st side

below
heake-
is for
ess the
Gari-
e, and
Valley.
bold,
ne east
valley
st rise
e Bat
broken
Sphinx

was in
s were
racter.
which
nds in
ibaldi.
three
y, the
oppor-
accom-
below

ort by
Round
party.

The
ne 8th,
ursion
excited
arty of
ed the
main
e tim-
cended
flows

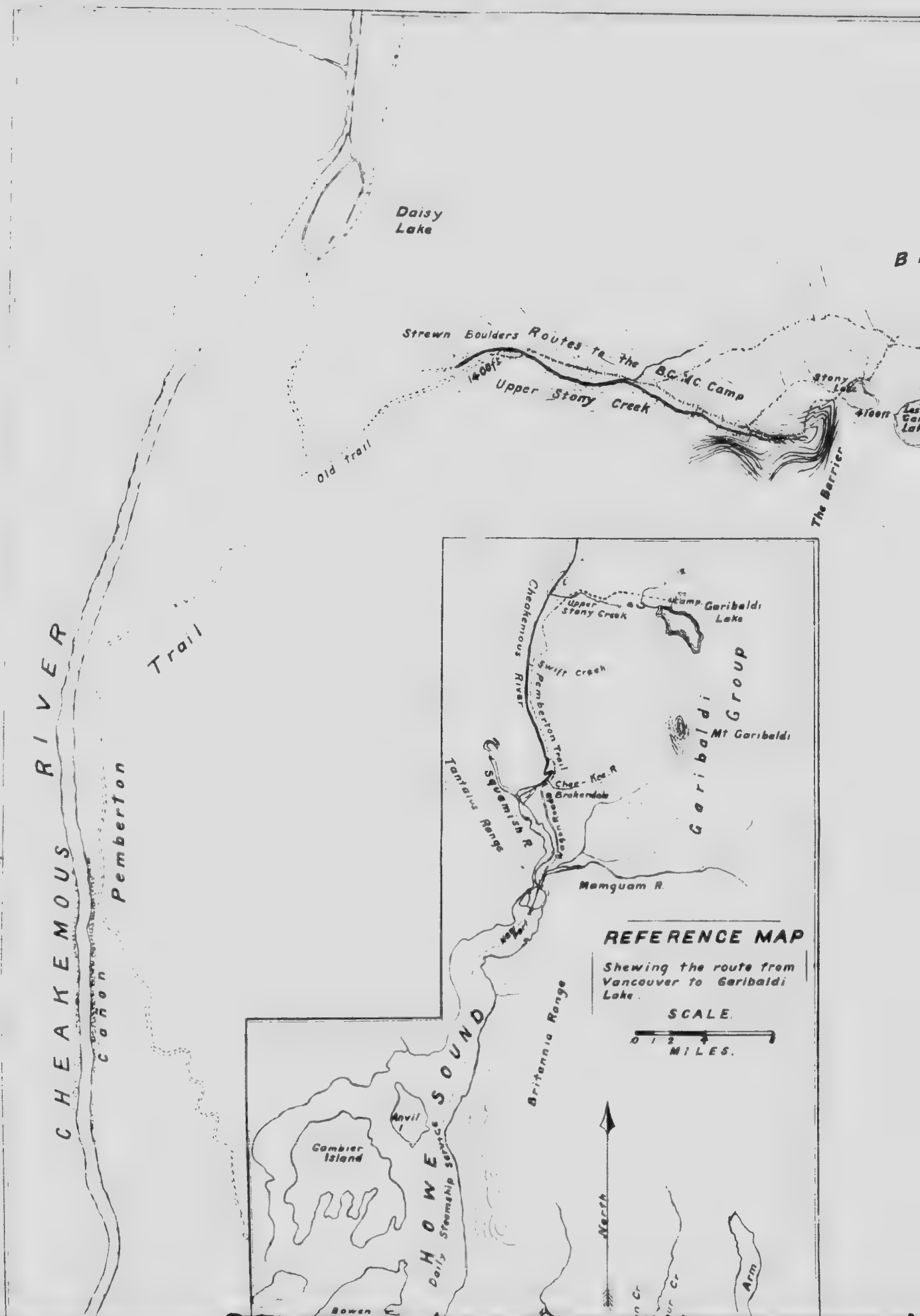
size and small, flowing outwards on all sides of the mountain. It is

and the east side
River

directly below
is the Cheake-
ne debris for
is doubtless the
waters of Gar-
ern shore, and
kamous Valley.
stains the bold,
ies from the east
rops to a valley
in northeast rise
eared to the Bar-
ses like a broken
the Sphinx

er, I was in
members were
one in character.
en Ridge, which
and extends in
of Garibaldi.
edge about three
ish Valley, the
and good oppor-
was a com-
ment below
peak.

N. fort by
the Round
of the party
camp. The
and on the Stn.
your own
and excited
party of
reached the
But the main
as the time
descended
flow and flows



SKETCH MAP

of a portion of
the

GARIBALDI GROUP

of mountains in the vicinity of

GARIBALDI LAKE.

British Columbia.

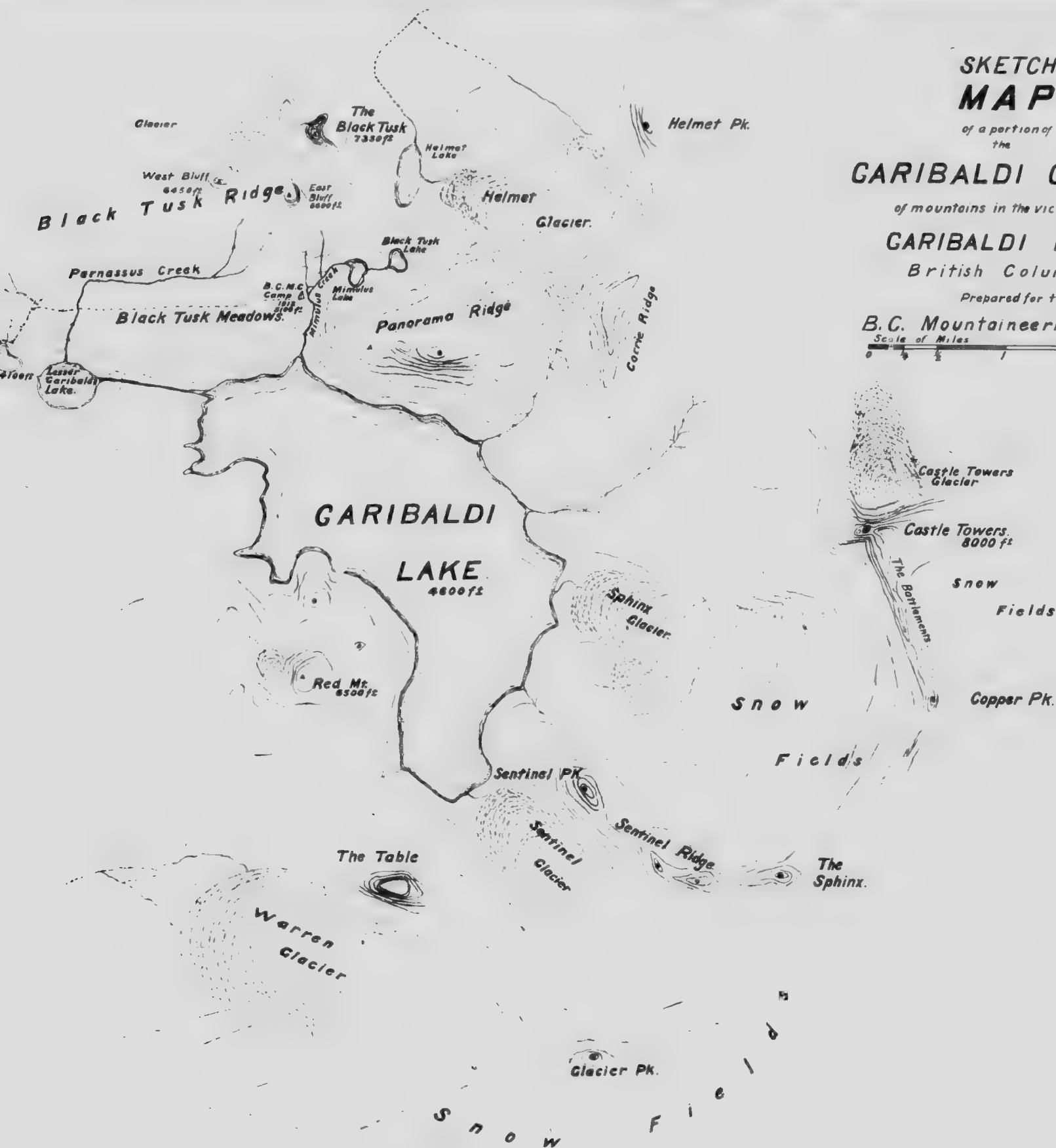
Prepared for the

B.C. Mountaineering Club.

Scale of Miles



W. J. Gray.
1912.

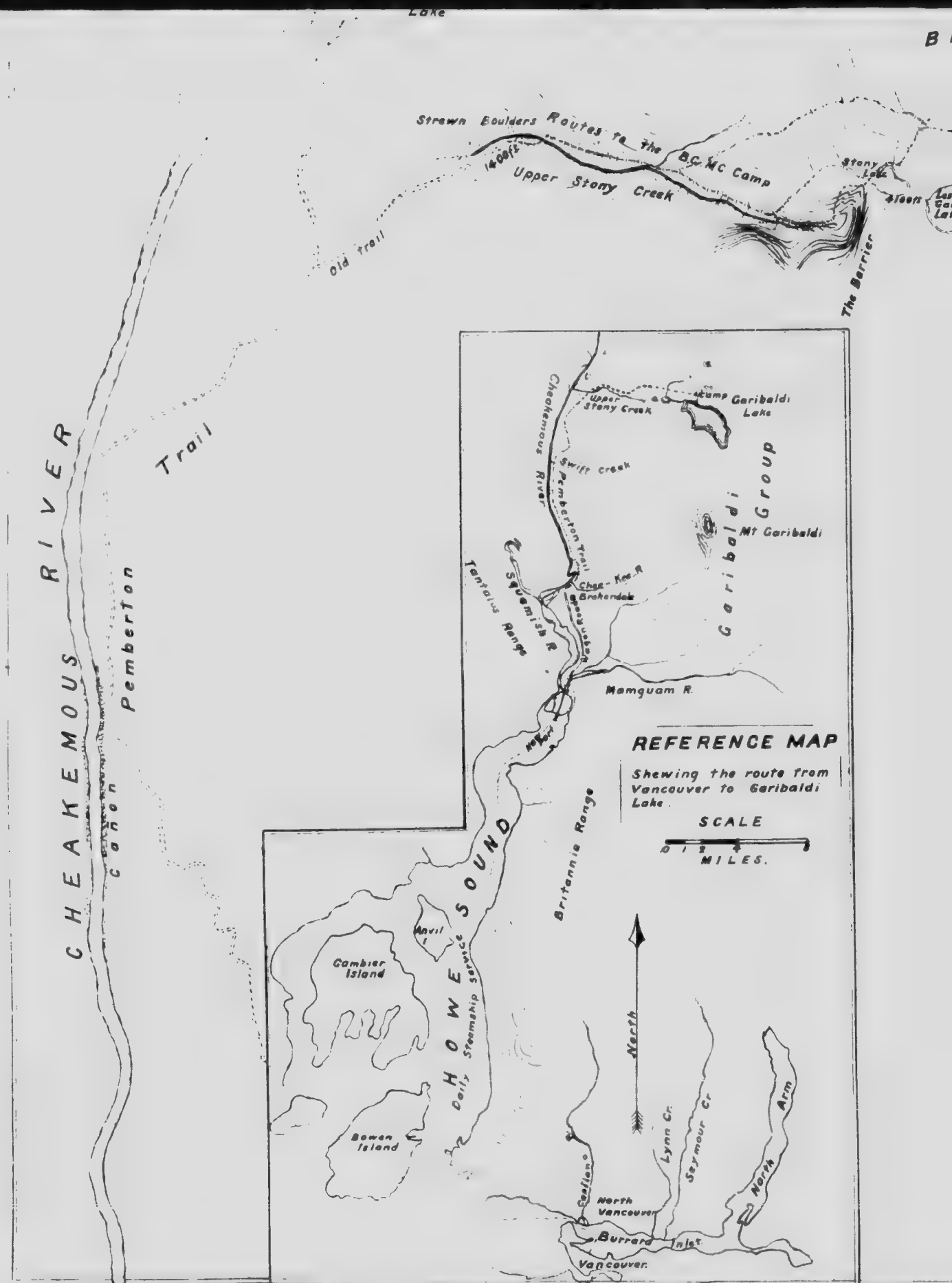


The elevations were
ascertained by an aneroid

the east
valley
rise
Bar
broken
Spain

it was in
were
character
R for which
extends in
Garibaldi
three
Valley the
good oppor
com
Tele

N. by
and
party
The
on the Stn.
excursion
had excited
party of
the
main
the tim
descended
flows



Black Tusk Ridge

Glacier.

of mountains in the vicinity of

GARIBALDI LAKE.

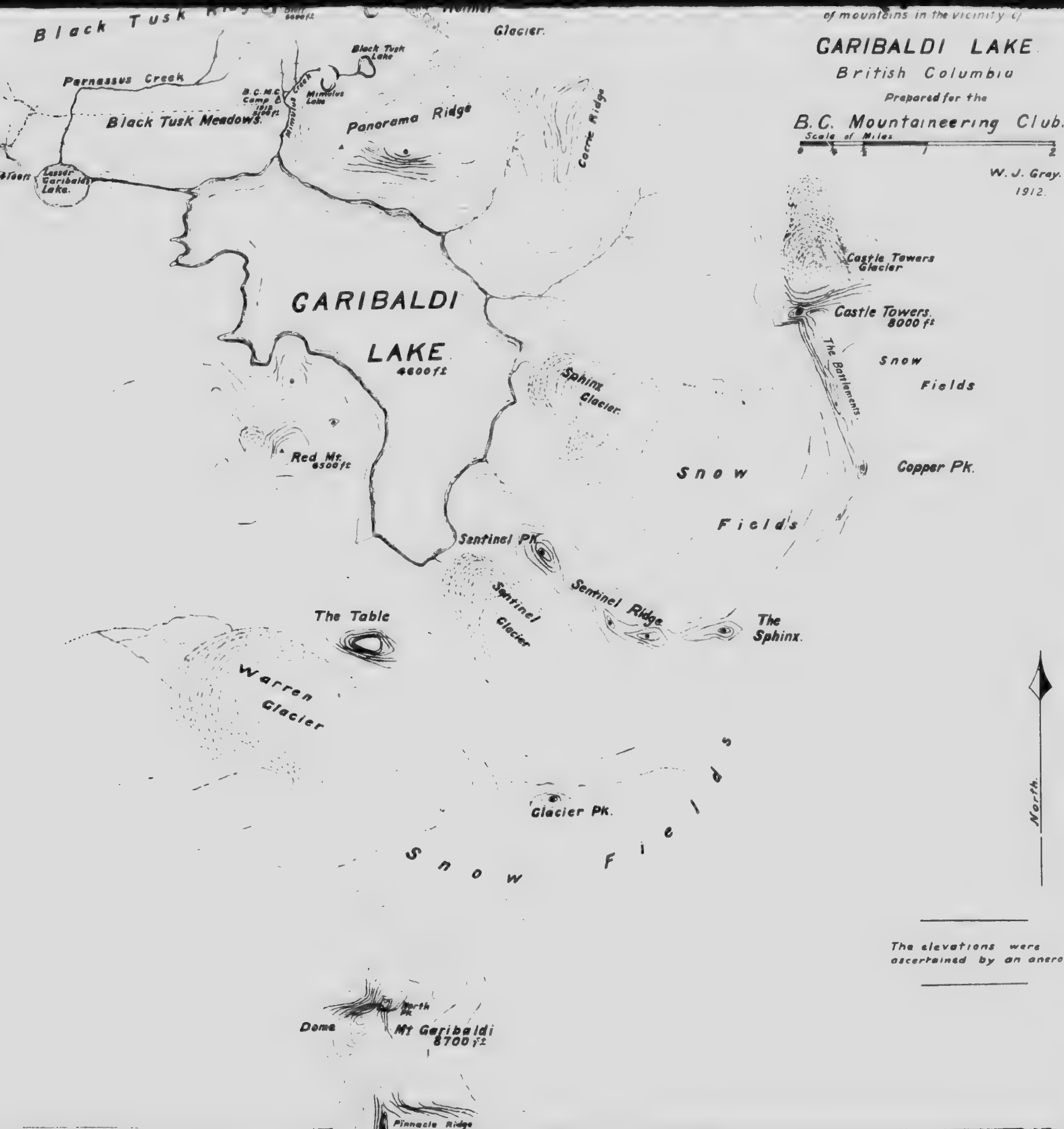
British Columbia

Prepared for the

B.C. Mountaineering Club.

Scale of Miles

W. J. Gray.
1912.



The elevations were
ascertained by an aneroid

first to the Mud River, which rises in the Garibaldi Glacier and flows

around the east and south of Round Mountain Ridge, joining the Mamquam River. Here the first obstacle was met with, as a bridge had to be thrown across the river, along whose bed the boulders were being noisily swept by the rapid current. A succession of steep-sided ridges running parallel to the river had to be traversed on the other side; and this, too, meant delay.

On leaving these ridges the party ascended to the Lava Glacier, crossing it diagonally to its eastern edge, and passed Rampart Lake, a remarkable sheet of water which deserves some special mention. It is enclosed between a low crescentic rim of rock and the glacier, which, flowing across the horns of the crescent, forms the western boundary of the lake. The icy walls rise abruptly from the water to a height of perhaps twenty-five feet, forming a natural dam, as in the classic example of the Marjelen See in the Alps. The ordinary way of escape must be underneath the glacier; but there were traces of a high-level channel over the rock on the eastern side.

Descending from Lava Glacier, the party arrived at the shores of Lake Mamquam, a fine sheet of water lying near the base of the Pyramid. It is about a mile long and is bounded on its northern shore by a long rocky ridge, from the crest of which a fine view is obtained of the Pyramid Glacier on the north. The party camped for the night at the southern end of the lake, near its outlet.

At daybreak on the following morning we set out to make the ascent of Mamquam. We skirted the southern slopes of the Pyramid to a long marsh which stretches far down towards the Mamquam River. This marsh presents a depressing aspect in the early morning. It is covered by a dense growth of willows, which are interwoven so closely, and are so covered with slime that progress is slow and difficult. Emerging from the marsh, the party crossed a number of streams issuing from the Tye Glacier, which flows down a wild and rugged amphitheatre between Mamquam and the Pyramid. The ice is much crevassed.

From here the route led up a buttress to the Mamquam snowfield. No difficulties were encountered, and the climb was very pleasant. As the party ascended, the different objects which had been passed on the journey came gradually into view. Immediately below were the willow marsh and the valley of the Mamquam River. Farther off towered Garibaldi above its wide snowfields and glaciers, resembling a huge saddle in profile.

The buttress terminated at a height of nearly 7,000 feet in a rocky rim, from which the whole extent of the Mamquam snowfield could be seen. The snowfield, which lies in a huge basin, feeds various glaciers, large and small, flowing outwards on all sides of the mountain. It is

flanked on its southwestern edge by a series of sharp peaks and ridges of granite, the whole presenting a very wild appearance.

The highest peak of Mamquam stands on the southwestern edge of the snowfield. In order to reach it we had to walk about three miles across the snow. At first the surface dipped suddenly. It then changed to an easy and continuous ascent to within a few hundred feet of the final peak, which was climbed without difficulty, the aneroid registering 8,400 feet at the summit.

The mountain had been named Mamquam by the members who had climbed it two weeks previously, this name being selected because of the important position that the mass holds in relation to the Mamquam River. After a short stay on the summit, we re-crossed the snowfield and descended to Lake Manquam, reaching it at sundown. The party returned next morning to the main camp by the route across the Lava and Garibaldi Glaciers.

The next trip undertaken was the ascent of Garibaldi. At present there are only two known routes by which this mountain can be ascended. These are the north route, which leads up a dangerous snow-slope and an arete rising above the Warren Glacier; and the eastern route, which traverses the snowfield below the southeastern face, and then turns up a long snow-slope to the saddle. The latter route was selected by the party.

On leaving camp we first climbed Columnar Mountain, which derives its name from the columnar structure of rocks that compose it. The columns are very loose and insecure. Towering precipices surround it on all sides, from the bases of which immense taluses extend for hundreds of feet. It is frequently the case, especially during the night, that an explosion is heard on the cliffs above, followed by a loud rattling noise as masses of rock break loose and roll down the talus-slopes.

The course led down the northwest side of Columnar Mountain, and then up a cone-like mass about 6,000 feet in height, which in colour and texture resembled a huge ash heap. This is known as Diamond Head, and forms the foot of the arete which runs south from Garibaldi Pinnacle. From its summit a splendid view is obtained of the western slopes of Garibaldi. A prominent feature of these is the rapid disintegration which is taking place. The slopes are scored by deep gullies, down which showers of stones fall at frequent intervals, on their way to the timber line far below.

Leaving Diamond Head, the party descended to the Garibaldi snowfield, and traversed it under the southeast face of the mountain. At the northern extremity of this face another arete extends eastward from the Pinnacle. The arete shows at one place an almost vertical drop

edges of

rn edge
at three
It then
red feet
aneroid

who had
ause of
anquam
nowfield
ne party
ne Lava

present
scended.
ope and
e, which
rns up a
by the

, which
npose it.
urround
end for
e night,
rattling
s.

ountain.
n colour
Diamond
Garibaldi
western
integra
es, down
y to the

Garibaldi
tain. At
ard from
cal drop



The North Garibaldi Group from the summit of the Black Task

Facing Page 28

Photo W. J. Gray

of several hundred feet, but continues its course at the lower altitude into the snowfield in the form of a loose earthy ridge. The party crossed the arete below the drop, ascended the eastern snow-slope to the saddle, and were soon at the peak.

The three outstanding summits of Garibaldi are the Peak, the Dome, and the Pinnacle Ridge. The last named lies to the south of the saddle, while the Dome and the Peak rise to the north. The only ascent of the highest point of the Pinnacle Ridge has been made via the saddle by a party of five members of the Alpine Club of Canada. Unfortunately they had no aneroid with them, so the exact height was not recorded. It is quite possible that this pinnacle may be slightly higher than the Peak.

Owing to the attractive character of the country to the north as seen from the summit of Garibaldi, it was decided that the next trip taken by the party should be in that direction, especially as this was unexplored country so far as we were aware.

The following day a party of ten left camp with three days' provisions, and, traversing the eastern slope of Columnar Mountain, ascended the Garibaldi Glacier. Once on the snowfield above, the travelling was excellent, no crevasses being encountered, and a straight course was followed for the next two hours. Garibaldi presents a remarkable appearance from this side. The eastern face of the mountain rises in grand profile against the sky. The neve is broken into a network of close crevasses where the slope begins to steepen.

It was intended at first to cross the Garibaldi snowfield in a northern direction, and descend the Sentinel Glacier to Garibaldi Lake. But it soon became evident that this would entail more labour than was anticipated. It was therefore decided that a northeastern course should be followed, as the distance across the snowfield seemed shorter. Late in the afternoon the crest of the snowfield was reached, and a good view was obtained of the country which lay beyond. Sentinel Ridge rose on the west, its numerous peaks hiding Garibaldi Lake, and forming with Copper Peak, the Battlements, and Castle Towers, a rugged crescent, between the horns of which the Sphinx Glacier flowed westward to the lake. In front, and far below, could be seen the upper end of a valley which extended to the Pitt River. From Sentinel Ridge a buttress led down to the head of this valley. The flank of the buttress seemed to offer the only suitable place for camping. An easy descent to the buttress was made by way of the Pitt Glacier, and the camp was pitched several hundred feet above the floor of the valley. The Pitt Glacier is joined by a smaller one which flows down from Sentinel Ridge. The medial moraine below the junction is made up of very hard fragments, which

are in some cases almost rounded. It is worth noting in this connection that in the Garibaldi Glacier, where the moraine material is of volcanic origin and much softer, the stones are nearly all angular, few of them being even sub-angular.

The party decided to Climb Copper Peak and Castle Towers next day. An early start was made, and, travelling north along the slope above the head of the valley, a point in the crescent was reached which commanded a view clear down the Sphinx Glacier to Garibaldi Lake. A little to the right was Copper Peak, with the jagged wall of the Battlements connecting it to Castle Towers. Copper Peak seemed to be the highest, so it was climbed first. We found, however, that Castle Towers rose still higher. A large snowfield lay on the north of the Battlements, and seemed to offer a good route by which the Towers could be reached. Six of the party set out for it. They crossed the snowfields and climbed the peak, christening it at the same time. Castle Towers is about 8,000 feet high and is, perhaps, the next highest summit to Garibaldi among those which stand on the east of the Cheakemous River.

The idea was conceived during this trip of holding the camp of 1912 at Garibaldi Lake. As viewed from Copper Peak, the land about the lower end of the lake seemed to drop suddenly into the Cheakemous Valley, and appeared to offer a good route by which the lake could be reached. This happened to be the case. Early in July of 1912 a camping place was selected on some broad meadows running in the form of a terrace for over a mile along the southern slope of Black Tusk Ridge, at an average elevation of 5,000 feet above sea level, and 400 feet above Garibaldi Lake. The Black Tusk meadows, as they have been named, are the finest of their kind in the district, and are in a very convenient position for a mountaineering camp. They command a complete view of the northern part of the Garibaldi group, and are so placed that interesting excursions can be made from them in every direction.

The camp of 1912 was held between August 6th and 17th. On August 4th our party left Vancouver for Newport. From that place the stage was taken for about seven miles up the Squamish Valley to Brackendale, where the night was spent. On the next morning the Pemberton trail was followed for twenty miles to Upper Stony Creek, to which point the provisions had been previously taken by pack-horses. It was now necessary to carry them on our shoulders to the camp, a distance of about five miles from the trail. The next day we got the loads up the bed of Stony Creek to an altitude of 3,000 feet. We then climbed the lower part of Black Tusk Ridge, which extends from the Cheakemous Valley eastwards along the north side of the creek. At a height of

4,500 feet the lower end of the meadows was reached, and two hours more of tramping brought us to the camping ground.

Most of the names by which the features of the northern part of the Garibaldi group are designated on the map were given in 1912.

One of the most remarkable features near the camp is the Black Tusk, a peak of 7,350 feet altitude, which rises abruptly out of the long and gently sloping ridge of the same name to a height of 800 feet above it. Viewed from the camp, which was situated directly below it, and, indeed, from almost any point, its sides appear to rise almost vertically. On closer inspection numerous steep gullies are seen to cut deeply into the sides and afford easy access to the summit. The only danger is from the loose fragments which strew the gullies, and make it advisable for only one person to ascend at a time. The peak is composed of basalt, which is jointed so closely and completely as to divide it into irregular columns. These columns are so loose in places that they can be moved by the hand. It is almost a puzzle how the sides of the Tusk can stand at so steep an angle. The lower portion is largely formed of andesite. To the east of the Black Tusk is Panorama Ridge, which extends towards Castle Towers for nearly a mile, its southern slope falling steeply to Garibaldi Lake, whose waters wash its base. Further east the Corrie Ridge runs north above Helmet Glacier. This glacier, though a small one, is thoroughly typical. It carries with it a considerable quantity of scoria, which is ground up into a black mud and deposited in a lateral moraine on the north side. Streams flowing out of the glacier have cut channels through the moraine in a few places, exposing a finely bedded structure. Lower down these channels the moraine was found to be underlain by ice, charged with the volcanic material of which the moraine is formed.

As was stated earlier, the Sphinx Glacier occupies the corrie which is enclosed by the crescent formed by Sentinel Ridge, Copper Peak, the Battlements, and Castle Towers. On the southwest side of Sentinel Ridge the Sentinel Glacier comes down from the Garibaldi snowfield. It and the Sphinx Glacier are the chief feeders of Garibaldi Lake. Red Mountain rises on the south side of the lake to an altitude of 6,500 feet, and overlooks the Warren Glacier on the south. The photograph facing page 28 gives some idea of the North Garibaldi group as seen from the summit of the Black Tusk.

One of the trips which we made from camp was to Red Mountain. We skirted the west end of the lake, and climbed the south side of the mountain. From the summit a very fine view is obtained of the Table, Garibaldi and the Warren Glacier. It was on this climb that we specially noticed the structure of the Table, which lies a short distance

from Red Mountain, and presents some peculiarities. It has steep, rugged sides, similar to those of the Black Tusk, but instead of terminating in a peak it shows a perfectly flat top like the outliers of Arizona and Mexico. On its southwest side there is a remarkable arch, which causes the mountain to resemble a huge jug, the arch taking the place of the handle. It forms one of the most conspicuous land marks of the group. Its structure is apparently identical with that of the Black Tusk. It is seen in the photograph facing page 48.

The most remarkable geological observation was probably the manner in which Upper Stony Creek drains Garibaldi Lake. The creek flows down a valley confined between the lower extremity of Black Tusk Ridge on the north, and a ridge running down from the direction of Garibaldi Lake on the south. The whole valley bottom is occupied by an immense field of boulders, through which the creek has worn its channel. The appearance of the valley is that of a long, narrow trough, with an almost level bottom. Near the mouth of the creek the field of boulders approaches a mile in width. The valley is terminated above by a huge precipitous bluff, which has been named the Barrier, and rises to an altitude of 4,500 feet. It is over a thousand feet higher than the boulder flat. The creek can be traced upwards to the base of the talus slopes leaning against the Barrier, where it springs from the union of a number of little streams that ooze through the talus. From this point upwards no more is seen of it until Lesser Garibaldi Lake is reached, at least a mile horizontally from the base of the Barrier. The stream is there seen rushing down from Garibaldi Lake into Lesser Garibaldi Lake. From this point it follows an underground course, probably as a network of channels to the base of the Barrier, where it reappears as Stony Creek. Between Lesser Garibaldi Lake and the Barrier lies Stony Lake, which is drained in a similar manner. Both lakes showed a high-water mark of about fifteen feet above their summer level, and had no apparent connection at the time we saw them. There is, however, a shallow depression between them which must furnish a connection during high water. A similar depression lies between Stony Lake and the brink of the Barrier. It is worthy of note that these two lakes are situated on a lava bed which covers a large portion of the country south and west of Garibaldi Lake, and that the lower part of Black Tusk Ridge alongside the Barrier is composed of impure limestone. This may account for the percolation of the water. The Barrier itself presents a good vertical section of the lava bed. Its position with regard to Stony Creek suggests that the lava flowed down from the vicinity of Mount Garibaldi, and formed a dam in the upper part of the valley, thus completing the basin in which Garibaldi Lake lies.

steep,
termini-
Arizona
which
face of
of the
Black

ly the
creek
Tusk
ion of
ied by
orn its
rough,
e field
above
r, and
r than
of the
union
m this
ake is

The
Gari-
obably
ears as
er lies
howed
l, and
how-
ection
Lake
o lakes
ountry
Black
estone.
itself
regard
ity of
valley,



Mount Yamnapum from Rampart Lake



Photo C. Chapman

Rampart Lake Tava Glacier as seen from shore

Beyond the Province

BY CHARLES CHAPMAN.

MOUNT BAKER—The trip to Mount Baker provided one of the severest tests of mountaineering knowledge and endurance in last season's programme. It may be worth while, in case this publication comes under the notice of any European climber, to say that the volcanic cone of Mount Baker is almost exactly the same height as that of Etna, while its conical form is equally perfect, except on the west side. The western slope is broken, as in the case of Vesuvius, by the remnant of an ancient crater rim, within which the present gigantic cone has been built up. The timber line is at an elevation of 5,000 feet, and the snow-line a few hundred feet higher.

The members who attempted the climb were entertained in Bellingham by the Mount Baker Club before leaving for Glacier to begin the ascent. Their enthusiasm was put to a severe test on the trail from Glacier by repeated showers of rain, which gave promise of a stormy day on the morrow. Camp was made for the night seven miles up the trail at an elevation of 2,900 feet. Three members had preceded our main body; and when we arrived in camp they had just returned from the summit, which they had reached under adverse conditions.

At six o'clock on the morning of June 30th a start was made for timber line, following the trail to the foot of Heliotrope Ridge on the west side of the Roosevelt Glacier. The wildest weather prevailed. The drifting mists gave occasional views of perpetual snow or grotesque masses of volcanic rock. Whirling gusts blew across a hundred yawning crevasses on the broad icy surface, chilly from their journey over snowfields and ridges. Sometimes the clouds broke overhead and roused momentary hopes of a lull in the storm; but the hopes were quenched by merciless showers of snow and sleet. As the party got beyond the sheltering rocks and bushes of the ridge at an elevation of 4,800 feet, the full force of the wind from the blue-green ice was felt. Its size grew rapidly smaller as one member after another, soaked to the skin, turned to make a glissade towards the camp fire which had been built on Heliotrope Ridge. At 6,400 feet the attempt was abandoned by the few survivors, who returned to camp half frozen.

Most of the party were ready to postpone the trip until better weather had set in; but four members made another attempt in the afternoon. At an altitude of 7,600 feet a thick fog stopped their further progress and the climb was again reluctantly given up.

On the succeeding day the final attempt was made. Bad weather still continued, and the start from timber line did not take place till eleven o'clock. Trudging knee-deep through snow, following a compass course in a thick fog, our progress was slow; but the base of the Dome was reached at last. We ascended a bare ridge of rock to an altitude of 9,600 feet, where we met our most exciting piece of work. The ice was thinly covered with snow in places, and steps had to be cut to make a secure foothold. This was especially the case along the lower lip of an ugly crevasse which stretched across our path, and looked like a complete bar to further progress. A slight thinning of the fog enabled us to find a snow bridge, which we crossed in safety. From this point steps were cut to the summit. Particular attention was paid to these, as they were to be of great importance in returning.

No less thrilling was the descent. A blinding snow storm was rapidly obliterating the trail. The steps so laboriously cut were hard to find, hands and feet were half frozen, and the black line of the open-mouthed crevasse a few hundred feet below stopped all undue hilarity. When this was safely crossed, good time was made over the glacier under the shadow of the Black Buttes. The trail, though hard to discern, assisted the climbers to avoid many an obstacle. Not a photograph was taken, the sun was scarcely seen, the peak was never visible in its entirety, the climbers had been chilled to the bone, water dripped from their garments; yet they were exultant in their triumph around the camp fire after the mountaineering meal.

MOUNT RAINIER.—In direct contrast was the ascent of Mount Rainier. Steamer, train, auto and stage were used in reaching the timber line. A comfortable hotel stands at an altitude of 2,700 feet in the Rainier National Park, and it is easily reached from the railroad by means of a good auto service. A stage covers the fourteen miles from the hotel to Paradise Valley, or a seven-mile trail alongside a winding stream may be used instead if one chooses to walk. A camp is established at timber line during the season, where good beds and meals are obtainable.

We had the whole day before us, and decided to ride up from the hotel. Seats were found for us in a conveyance meant to carry six, but into which the enterprising driver managed to squeeze a round dozen. We learned from one of our fellow sufferers that he had climbed the mountain some years before. With a desire for obtaining any information which might assist us in making the ascent, we encouraged him to talk. He told us that the most dangerous part was while traversing the base of the towering cliffs known as the Gibraltar Rock. (Local

spelling.) It was usual, he told us, to begin the ascent very early in the morning, in order to pass this danger point before the sun had gained sufficient power to loosen rocks or ice, which would roll down on the climbers below. On being asked how it was avoided on the return trip, he replied that "a fellow was tired then, and it didn't matter anyhow." In his cheery company we arrived at the Paradise Valley, a place well named.

After pitching our tent under a sheltering clump of trees, amidst a profusion of mountain flowers, we climbed to an elevation of 8500 feet the same afternoon, in order to learn a little about our route to the summit.

At one o'clock in the morning of July 29th, the three sleepers left their beds on the heather, and completed their preparations for the ascent by the light of a full moon. At two-fifteen a start was made up the long scoriaceous ridges and snowfields by which route the mountain is usually climbed from the southern side. The Nisqually glacier, far down to the left, looked vague and shadowy in the pale moonlight. The morning breeze coming up from the glacier was, however, a thing real enough to be an effectual spur to the party.

At an elevation of 10,000 feet we overtook another party of climbers, led by one of the official guides who are stationed in the valley. They were just about to separate, some to return to camp, and some to attempt the climb to the peak. In the chill morning air they made an effort to join in a chorus, which so aroused the spirit of emulation in one of our members that he voluntarily sang a stanza to the effect that "he would rather go supperless to his bed than rise in the morning early." The knowledge that they were not the only people who had risen before cock-crow appeared to cheer the first party wonderfully. We all hailed with delight the advent of the sun.

The majesty of the mountain was fully realized as the soft morning light crept over the sombre crags of the Gibraltar Rock, lighting its shadows and bringing to view the traces of volcanic action on its weathered walls. The icy ramparts of the hanging glaciers turned to rose and gold, snowfields glittered with gems, and miniature avalanches, like crystal streams of pearls, tumbled down time-worn channels under the influence of the sun's rays.

Continuing the ascent, we passed the "Bee-hive," the most conspicuous projection on the ridge that leads to the base of Gibraltar Rock. The trail was easily followed to this point, our heavy mountain boots leaving marked impressions on the soft rock. It was necessary to use great care in traversing the scree under the overhanging cliffs of Gibraltar. A continuous rattle of small stones kept us alive to the

THE NORTHERN CORDILLERAN

possibility of a bigger one coming presently; and it was a relief when we were able to get out on the snow and begin the ascent of the "Honeycomb." At eleven o'clock the top of Gibraltar Rock was reached, 13,000 feet above sea level.

The last fifteen hundred feet led over a large icefield, split by numerous crevasses, and was the only part of the climb where the rope was used. At one o'clock we reached the edge of the crater, 14,526 feet in elevation, where the Mazama record book was opened, and entries were made in the book.

The descent was made without special incident, save that while we were endeavoring to collect some of the mineralized water dripping from Gibraltar Rock, a shower of ice fragments came down, missing us only by a few feet.

The story of our climb beyond the province during last season would not be complete without a special mention of our honorary president, Mr. J. C. Bishop. He made the arduous climb to the summit of Mount Rainier with all the enthusiasm and vigor of youth. Of those who failed to make the ascent of Mount Baker in July, no one was more disappointed than Mr. Bishop. On September 23rd, however, accompanied by Mr. Wright, of Glacier, and Mr. Albertson, of the Seattle "Mountaineers," he returned to the attack, and succeeded in reaching the summit after the season was supposed to have closed.

"The mountayne men live longer many a yeere
Than those in vale, in playne, or moorish soyle
A lustie hart, a clean complexion cleere
They have on hill that for hard they toyle.

Thomas Burchvard.

Botanical Work for Mountaineers

By J. DAVIDSON, F.L.S., F.B.S.E.

British Columbia is far behind in scientific research, and no one need be afraid to put his shoulder to the wheel if he can help with the work which has to be done in every branch of natural science in the province. This backwardness is not because scientific work has been neglected, but because it has not been organized. Individuals have done much for the province; but their studies have been generally carried on for their own pleasure, and much useful information has been lost for lack of some means of bringing scientific workers together, and obtaining records which could be handed down for the use of others in the future.

Mountaineering in British Columbia seems to be in a similar position. If all that is known to our local climbers regarding the mountains within sight of Vancouver were recorded in permanent form, it would be a large and useful contribution to the knowledge of the province.

It is desirable, therefore, if the Club is not to work for limited ends, that some definite scheme should be arranged for all sections of the members, to ensure that scientific pursuits should receive as much prominence in its records as artistic and recreative ones. On the other hand, those interested in scientific work should not seek to exclude those who wish to pursue mountaineering simply for the exercise of the climbing art, and the recreation associated with it.

BOTANICAL WORK.

There is so much botanical work to be done in the province, and so much can be done by any willing explorer, that I propose to make a few suggestions as to what part might be undertaken by mountaineers in the complete scheme for the province, which would not overlap the work being done by others. There are many sections of the community who are in a position to contribute to our knowledge of the flora. We have natural history societies, teachers, surveyors, prospectors, lumbermen, and many other people who have opportunities of making outdoor studies in botany. But there is a special field open to the climbers.

THE ALPINE PLANTS.

As there are mountaineers in various parts of the province, I should be glad to learn that others besides our local members are willing to co-operate in ascertaining the number and distribution of our alpine plants. The plan given here will, I think, be applicable to any district in British Columbia.

The first thing necessary is a good and reliable map of the mountain or series of mountains to be worked over. If no such map exists, the Club should set to work and prepare one for its own use; and, when completed, it should be issued in permanent form for future reference by members and others.

The map should show as far as possible:

- (a) *The correct positions of the various summits in the series.*
- (b) *The local names of all summits.*

If no names exist, the Club should decide on names by which the summits are to be known. Avoid calling them after people. It is desirable to use names which mean something in relation to the flora, fauna, geology or general topography, unless a euphonious Indian equivalent in

should be named after the nearest dominant mountain.

and rivers should be named.

Creek which originates from the overflow of a lake may take the name of the lake. If one creek feeds the lake, it may be called the *Upper* — *Creek*, the overflow being called the *Lower* — *Creek*. *The* should be named after the creeks which drain them.

Passes and canyons should also be named.

Altitudes of as many points as possible should be given.

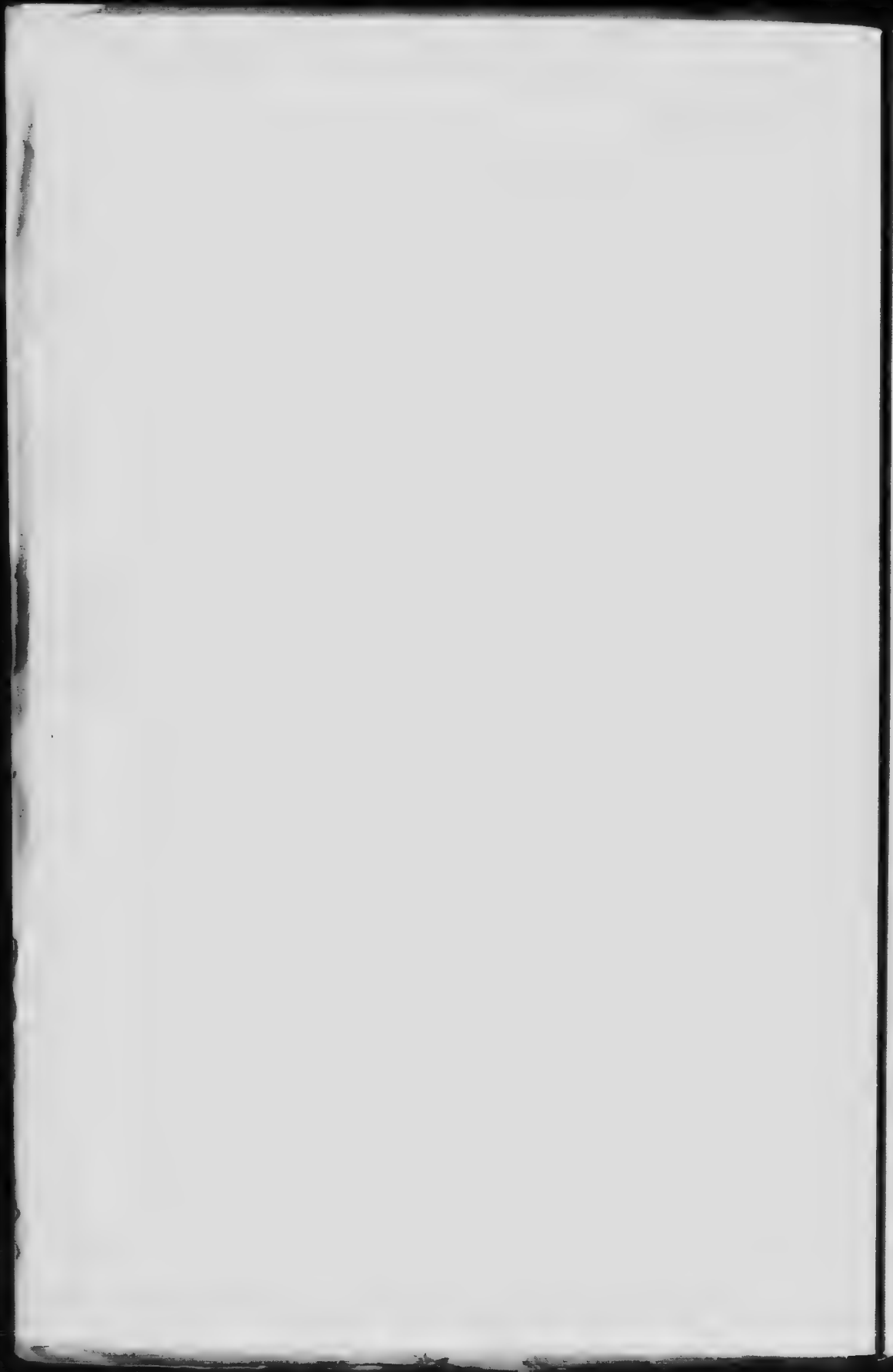
The position of the series should be indicated by approximately correct

The of map-making does not require great technical skill. Anyone with average education and the power of intelligent observation should be capable of doing it. In support of this I would refer to the very creditable specimen, prepared by a member of this Club, to illustrate the region north of Garibaldi Mountain. Greater detail given in a map will of course secure greater ease in making records, besides increasing the value of each record. A closely detailed map is absolutely necessary for the best kind of work.

As the local Club has a number of botanical students, I may suggest a piece of work for them, and thus illustrate what might be done by other Mountaineering Clubs.



Site of the Camp 1012 Black Tusk Mountain



We may take the Grouse Mountain series (i. e., the mountains between Capilano and Lynn Creeks) as a basis for comparison with other mountains. We must first get it thoroughly mapped and named. We have then to make as complete a collection as possible of all the different kinds of plants to be found there, indicating the exact locality where found, and the habitat, whether in bush or in the open, wet or dry, soil or rockslide. In addition to the showy flowering plants, we must collect grasses, sedges, and all water plants, whether submerged, floating, or growing on the margins of creeks and lakes. We must have them all classified, verified, and recorded. Each member should endeavor to find some plant on the Grouse Mountain series of peaks which has not been previously recorded for this series. After the complete flora is known, we can set to work and ascertain their distribution on these mountains. Examples of questions to be solved by research are: What plants are to be found on the southern slopes which are not to be found on the northern, and *vice versa*? On the west and not on the east? On Grouse and not on Dome? On Goat and not on Grouse?

We should make notes on the distribution of selected plants, such as the White Rhododendron (*Rhododendron albiflorum*), False Heather (*Bryanthus empetrifomis*), the so-called "White Heather" (*Cassiope Mertensiana*), and so on. We should also find out the lowest altitude at which they are found, and what plants are usually associated with them.

Two or three marshes may be selected for study. The questions arising here are: What plants do you find common to all of them? What plants do you find peculiar to one and not found in the others? Lakes are dealt with in a similar way.

There are many other interesting topics which might be taken up; but the above will be sufficient for a year or two if properly gone about.

SUITABLE METHODS OF RECORDING.

There are many systems for recording the occurrence of specimens, all of which are good, though some have advantages over others.

The ideal method for showing the distribution of each species is to have a miniature outline map of the area, and mark the positions where it is found by a sign which also indicates whether it is common or rare in that locality. By this method each species has a small map to itself.

It is unnecessary, however, to go into such detail for a small area of only a few square miles. Probably the simplest method would be to use loose-leaf record sheets of foolscap size, arranged as shown in the illustration.

The member in charge of a given area might commandeer the services of photographic members to assist him in illustrating points he wishes to bring out, and his paper might be profitably illustrated by lantern slides of special groups of specimens, or plant associations.

No doubt there are many in Vancouver who would be glad of the opportunity of obtaining such information from trained observers, and would be willing students of nature, if they saw that there was a definite intention to practise exercises of this sort, and disseminate interesting and useful knowledge.

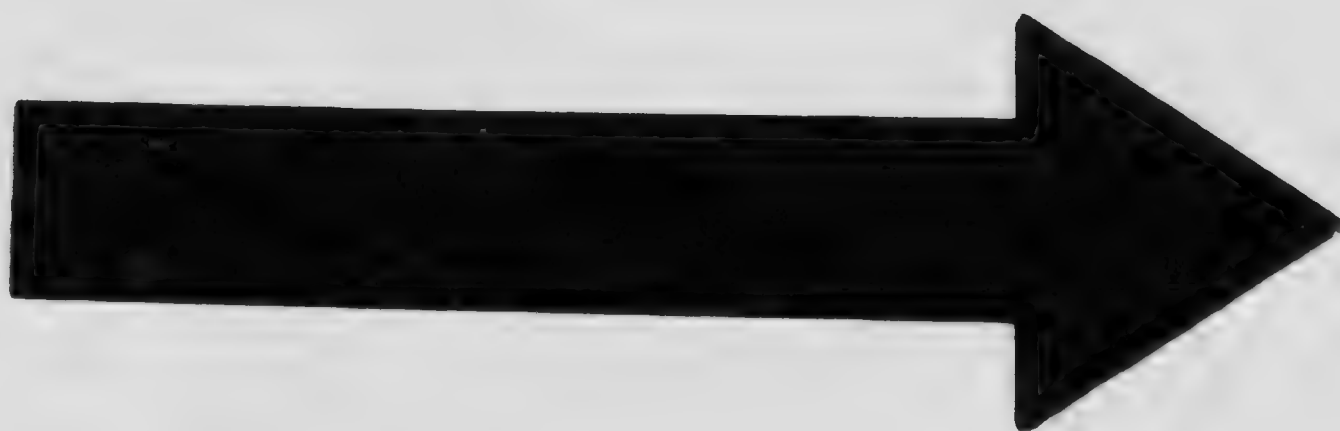
Towards the end of the winter session the Club might arrange to have some open meetings, when the public could have an opportunity of seeing and hearing what the Club had been doing during the summer. At these meetings, two or three of the members might relate the most interesting parts of their papers, illustrated by lantern slides, and possibly by an exhibition of prepared and mounted specimens.

By showing results of this kind, fewer words will be required in praise of mountaineering, and visitors attending the open meetings will more easily understand that there is something else in mountaineering than a mad rush to the top of a mountain and down again.

In addition to the work of individual members, the Club should see that the scientific results are duly recorded in permanent form in future issues of the magazine. As complete a list as possible of all the plants found during the year should be given, while additions may supplement this list in successive issues. A short synopsis of the papers given by members would also be useful.

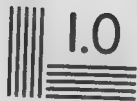
Special attention has been directed in this article to the flora of the Grouse Mountain series. But the final records of this flora will not be looked on as the end of the Club's activities in this direction, but will serve rather as a basis for comparison with other mountain areas which the Club may select to work over. The members will be in a better position to interpret correctly what they see on other ranges. Familiar specimens on a new range will be hailed as old friends; while new specimens will prove all the more interesting, and due attention will be paid to their environment and distribution. A list of the specimens found on a new mountain, which are not to be found on the "home" series, will be read with interest by botanists and others in many parts of the continent.

At the present time the flora of the mountains within sight of Vancouver is not known. Of course one meets with numerous individuals who "know every plant and every foot of ground for miles north of Burrard Inlet," but——!



MICROCOPY RESOLUTION TEST CHART

1010-1010 TEST CHART



1.0

28



2.5

32



2.2

36



1.1

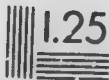
4



2.0



1.8



1.25



1.4



1.6



APPLIED IMAGE Inc

For instance, last summer my attention was called by one of the members of the Club to a plant which had been seen on Grouse Mountain, and which he described as having no leaves, but a cluster of pale pink flowers. There are several plants in B. C. which answer to this description; but his specimen did not appear to resemble any of those previously recorded for that locality.

A visit was made to the mountain; and there, within a stone's throw of the main trail, I was shown a large number of beautiful clusters of what I supposed was *Newberrya congesta* Torr. or *Pleuricospora fimbriolata* Gray, but which on closer examination did not match either exactly, though they come very near to *Newberrya*.

In either case it constitutes a new record for this part of the province, if not an entirely new record for British Columbia, as both the above have their range of distribution described as "from California to Washington and Oregon."

Again, during a four days' collecting and botanical survey trip to Black Mountain, accompanied by two members of the Botany Class, many plants of particular interest were found, amongst which was one—*Menyanthes* (*Nephrophyllidium*) *Crista-galli*, popularly known as Deer Cabbage, formerly looked on as an Alaskan plant, but which has been recorded for the north-west coast of Vancouver Island, Graham Island, and Prince Rupert.

It is now recorded for the lower mainland, there being thousands of beautiful specimens about five miles through the bush north-west of the Capilano, as well as on the marshy slopes near the headwaters of Cypress Creek. Probably the two plants mentioned will turn out to be quite common and widely distributed amongst these mountains; but hitherto they seem to have been overlooked, though they are by no means inconspicuous.

This will serve to show how much may be learned regarding the flora of British Columbia from a study of the flora of the mountains in our own neighborhood.

The Mountaineer as an Entomologist

BY R. S. SHERMAN, D.L.S.

When I accepted an invitation to write a paper on the subject of entomology I did so with a full understanding of the difficulties I should find in compiling an article which would be interesting and profitable to the average reader. I have wielded a butterfly net long enough to realize how little the average man is in sympathy with the pursuits of the "bug-hunters," as he likes to call us. But one becomes hardened to public indifference, pity or contempt. Once while swinging my net on the banks of a famous trout stream, a gum-booted disciple of the immortal Walton very kindly advised me to get a stronger landing net; and when I explained to him that I was merely catching flies with it, he gave me a look of compassionate sadness that fairly touched my heart. "Poor fellow!" he murmured, "but he looks quite harmless." An entomological friend of mine was accustomed to inform such inquisitive bodies that he was capturing swamp-elephants, or crocodiles.

The field covered by the word entomology is so great that you will not, I am sure, expect me to cover more than an infinitesimal part of it in the space allotted to me. Most mountaineers have found one species of insect keep them busy all day, and perhaps another species, all night. When we realize that the species of insects exceed in number those of all other animal forms taken together, we may be either staggered at the immensity of forms to study, or charmed at their endless diversity.

There are, broadly speaking, three classes of mountaineers, according to their aims and ambitions. Some seek mere physical exhilaration; others love the hills for their sublimity and beauty, and still others, very much in the minority, who combine with their desire for physical exercise and their love for the beautiful, a craving for intellectual stimulus, a definite desire to study minutely and exhaustively some special feature of mountain life, be it bird or beast, insect or flower, and thereby attain a general uplift of all their mental faculties. Let us designate these as the master mountaineers, the others being mere tyros and apprentices.

It has been my lot to traverse the hills with men of all classes, including hunters and prospectors, whom we may speak of as professional mountaineers, and I do not hesitate to affirm that only to the master mountaineer can the hills yield their richest treasures. He brings back with him from a climb, not only the luxury of physical fatigue and

a full kodak, but a store of knowledge which will be of untailing interest to himself and perhaps of lasting benefit to mankind.

Of all lines of scientific research and recreation none, I think, offers more alluring possibilities to the mountaineer than entomology.

This study may be taken up as a mere hobby, and, as such, it certainly ranks higher than the collecting of stamps or coins. A case of insects, neatly and scientifically arranged, represents many happy hours of healthy exercise among the flowers of field and wood and hill-side. Each specimen has given pleasure in its capture, instruction in its mounting and classification, and is a touchstone to conjure up on cold winter evenings the golden days of summer.

But the entomologist may and should rise to higher planes of endeavor than those trodden by the mere collector. The fields of research wherein he may labour, with pleasure to himself and profit to his fellow man, are numerous. The problems to be solved are not only of great intellectual interest, but many of them are of vital importance to humanity. It is impossible for one man to master this subject as a whole. Each to do any effective work must take some limited area of the great mosaic and try to master its design in detail.

Of such lines of research I need only emphasize one, the study of insect life in relation to our forests. British Columbia has a great asset in its forest-clad hills. But deadly enemies are constantly at work destroying what nature has laboriously built up. Nearly every plant and tree has its own peculiar foes. Their destructiveness is vast and scarcely appreciated by the uninitiated. The loss due to insect ravages in the United States alone has been estimated to be \$750,000,000 annually. A single species of fly destroy \$50,000,000 worth of property a year.

Only the trained entomologist can devise means to cope with these evils. But to do so he needs all the facts he can obtain in relation to the life history of insects injurious to plants of economic value. The humblest collector, so long as he has an observant eye and a systematic method of recording what he sees, as well as what he captures, can assist in this great work. And who has a greater opportunity than the mountaineer to discover facts in relation to the insect pests that infest and destroy our mountain trees?

I think that every mountaineer should familiarize himself with the external appearance and to some extent with the life history of the insects injurious to our forests. He would thus be equipped with sufficient knowledge to observe intelligently the insects he meets with in



Mount Mamquam from the West

Photo C. Chapman

Facing Page 44



his mountain rambles. In this Province he has the advantage of working in practically virgin soil. Almost any observations or collections which he may make are of importance.

Nor will he find it difficult to obtain assistance and encouragement in his work. The British Columbia Entomological Society is eager and able to aid all who wish to take up this important study, and I trust that the example set by the botanical branch of our mountaineering club will inspire others to take an interest in entomology, a study which I confidently reaffirm has more abundant benefits to shower upon its devotees than any other branch of recreative science.

I have emphasized the economic side of this study; but I do not wish you to forget its other phases. The greatest specialists have made their start as general collectors. The favorite order with beginners seems to be the Lepidoptera, comprising the butterflies and moths. Even the least observant of mountaineers must have been frequently charmed by the sight of these gaudy aviators of the hills. Perhaps next in popularity are the Coleoptera, or beetles—sturdy knights-errant, clad in coats of mail; some bent on mischief, others seeking to punish the oppressor and the malefactor. It is well to distinguish friends from foes. The Diptera, or two-winged flies, and the Hymenoptera, comprising bees, wasps, ants, sawflies, etc., are close rivals for third place. Then follow the dragon-flies, the bugs, etc. Nineteen orders in all are now recognized. My advice is to consider everything as fish which comes to your net. In this way you learn to distinguish and to classify and lay the foundation of accurate and complete knowledge of whatever family or order you ultimately specialize in.

Mountain Literature

The first essential in mountain description is accuracy; the second, lucidity. You do not know into whose hands those pages of yours may fall. Take no poetic license with either route or landmarks. The life of some eager but untrained climber may depend upon his being able to follow other guidance than that which your record affords. The man of science will thank you for your faithfulness; but, wanting that, he will toss aside as worthless the most elegant piece of rhetoric that ever came from human pen. The fellow-climber and the naturalist are the only critics to whom you are responsible.

Geological Features of the Coast Range

By J. PORTER, B.E.

Four well-marked ranges of mountains traverse the cordillera of British Columbia in a roughly north and south direction. Of these the Rocky Mountains and the Selkirks have been the subjects of attentive geological study since the completion of the Canadian Pacific Railway in 1885. The third range to the west has been examined by prospectors and geologists in the dry belt. But the Coast Range has received little study, except where some transverse river-valley has given the opportunity. The encircling forests are so dense, and the country so completely uninhabited, that access to the mountains is never easy. The glimpses we have gained of the possibilities for geological study in the near future are mainly due to the pioneer work of local mountain climbers.

A belt of granitoid rocks about a hundred miles wide extends along the coast of British Columbia from the mouth of Vancouver Harbor northwards to Alaska, where it swings to the east behind a chain of large islands, continuing its north-westerly course until it dies out in the Yukon. The mountains which form the Coast Range have been carved by the action of rain and streams out of these rocks. The granite belt possesses the batholithic structure,—that is, its material was forced up from beneath in a more or less fluid state, distorting the overlying rocks into an arch-like form, but not as a rule breaking through the massive cover. The action of the granite as it slowly worked its way upwards must be conceived of, partly as an upheaval of the cover, partly as a shattering and melting away of it on the lower side. The overlying rocks have been stripped off from by far the greater part of the area, together with a considerable thickness of the granite itself. The completeness of their removal, and the bold relief of the mountains which remain, show that the district stood high above the level of the sea for a long period after the intrusion of the granite. The altitude gave velocity and transporting power to the streams. These in turn, when charged with detritus from the higher levels, were able to cut down their channels so rapidly that the atmospheric agents had no chance to bevel back the slopes on either side at anything like a corresponding rate. The river valleys, as they deepened, marked off the surface of the high plateau into a number of bold ridges, which were further subdivided into distinct peaks through the formation of tributary valleys. A very clear view of the extent to

which this dissection of the mountain area has been carried can be obtained on a fine morning from the ridge which forms the back of the Eastern Lion. As the minutes pass between dawn and sunrise, the sea of mountains which lies to the north-east is gradually disclosed in row after row of peaks, their succession being clearly shown in the cold silvery light, only to be lost in a moment when the sun's limb peeps above the horizon.

The Coast Range belongs neither to the oldest nor the youngest of mountain groups. Its uprise does not go back a tenth of the way towards the time when the stratified rocks began to be laid down. Compared with the Scottish Highlands or the mountains in the south-west of Ireland, it is a thing of the day before yesterday. But it is very decidedly older than the Alps or the Himalayas.

PLUTONIC ROCKS

That completely crystalline structure which is not too fine to be detected at a glance by the naked eye, to which the term *granitoid* is applied, is by no means limited to the true granites. The Coast Range presents us with quite a series of rocks which have solidified under pressure from a great thickness of overlying material, and which are therefore known as *plutonic*. At one end of the series are the true granites, which are marked by the presence of quartz as a distinct mineral in tolerable quantity. Next come the diorites, in which the amount of crystalline quartz has fallen nearly or completely to zero, while the minerals which accompany the quartz in granite are partially exchanged for others. Gabbro is found at the other end of the series. The quartz has disappeared completely, while the rock is heavily loaded with iron and magnesia, to which gabbro is indebted for its dark green colour and its density. All these members of the plutonic series are, however, marked by the granitoid structure. Further details regarding these rocks may be found in the Geological Survey Report of Mr. LeRoy, 1908.

These varieties in the material of the Coast Range batholith do not as a rule give rise to obvious differences on the large scale. The difference between granite and gabbro is, however, obvious enough in the details of cliff and crag and summit.

An observer on Crown Mountain cannot help noticing a row of peaks with spiry outlines, standing a dozen miles to the north. They still retain the name which was first applied to them of "The Saw-Teeth," though the two most prominent have been re-christened "The Twin Sisters." It is easy to see, even at long range, that they are not composed of granite. No specimens from them have been obtained

as yet. It seems probable, however, that they are altered sedimentary rocks, in which case they are fairly certain to be fragments of the original rocky cover of the batholith, which have managed to survive the denudation that has swept it away elsewhere.

VOLCANIC ROCKS

The volcanic rocks are distinguished from the plutonic by the fact that they have solidified at the surface or at comparatively small depths, not exceeding a few hundred feet. The smaller pressure and quicker cooling to which they have been subjected has interfered with the development of the granitoid structure. Some of the mineral constituents have been dilatory in forming crystals, and present only small ones, or even remain in a condition but little removed from glass. Others again have developed crystals of fair size, which stand out markedly from the general fine-grained mass of the rock. This is the case with the feldspar of the porphyries, the white crystals of which are to be seen dotted all over the dark grey or brown surface of many of the pebbles in the creek-beds to the north of Vancouver.

One specimen of a volcanic counterpart to the granites has come to hand up to the present, in the shape of a rhyolite porphyry from a gully on the Black Tusk Ridge. The plutonic diorites have their counterpart in the andesitic lavas of the Garibaldi district. Its basalt, too, is the volcanic counterpart of the gabbro.

The investigations of Messrs. W. J. Gray and F. Carr in the Garibaldi district have been confined to the summer camp of 1912. Sufficient has, however, been discovered to show that it is one of great interest. The following outline is from Mr. Gray's notes.

Mount Garibaldi, the dominant feature, is purely volcanic. The solid rock which it contains is generally andesite porphyry. Little or no scoriaceous rock has been found on it such as would serve to show, by the blow-holes with which it was filled, that it had formed part of a lava-stream which had reached the surface. But there is abundance of loose fragmentary material, both in the form of fine ash and boulders, such as constitutes the major part of the accumulations around any ordinary volcanic vent. There is no reason to expect that any melting of the snows on the mountain would reveal the traces of a crater. The utter absence of any such thermal phenomena as are noticed on Mount Baker shows that the volcano has long been silent; and during that time the atmospheric agents have been busily at work on the mountain.

There is a striking object nine or ten miles north of Garibaldi which shows how far denudation has gone in the district. The Black Tusk is a typical specimen of a volcanic "neck." It is part of the plug



The Table Warren Glacier and Mount Garibaldi from Red Mountain

Photo W. J. Grace

of basaltic lava which solidified in the pipe of a volcano at that place. The basalt core has remained, while the loose fragmentary material of which the volcano was mainly composed has been swept away from around it, leaving this tower-like object standing 800 feet above the Ridge. The basalt of the Tusk shows a well-marked columnar structure. The Ridge is mainly composed of greenish grey andesite, which readily breaks up into slabs, and through which the basalt has been forced from beneath. The lower portion of the Ridge shows an extensive zone of agglomerate at a height of about 600 feet above the Meadows. The specimen of rhyolite porphyry already mentioned came from below the agglomerate. The relations of these different rocks are not easy to make out, as a heavy talus obscures the contacts. Panorama Ridge appears to be a continuation of Black Tusk Ridge.

The Table is another neck, which has not been dissected out so completely as the Black Tusk.

Standing on the summit of Garibaldi, it is easy to recognize a succession of volcanic peaks, which trend in a N.N.W. direction and extend towards the head-waters of the Lillooet River. These are all unexplored.

Andesite and andesite porphyry appear to constitute the major portion of the volcanic rocks in the Garibaldi district. No indications of mineral wealth have been noticed to draw the hardy prospector into these mountain wilds; so their study seems likely to be left to geologists who possess the qualifications of mountaineers.

GLACIAL PHENOMENA.

Reference has been made already to the altitude of the coast district, which made it possible for the streams to cut their channels deeply into the land surface. The altitude was still considerable when the glacial period set in. We knew this from the great depth of alluvium which has been disclosed by borings in the valley of the Fraser. A river cannot excavate to more than a few feet below sea level under any circumstances. The fact that the original channel of the Fraser in the rock is buried under many feet of alluvium shows that the river must have been flowing at a much higher level at one time.

During the glacial period the land underwent a depression of several hundred feet below its present altitude. Although it rose again as the ice-sheet vanished, it never recovered its former height. The coast-line of the province is deeply indented in consequence with the fiords which always result when narrow valleys are drowned, producing high, bold shores leading down to comparatively deep water.

The ordinary marks of glaciation can be traced over the mountainous district north of Burrard Inlet. Smoothed and striated rocks, moraines, morainic lakes, and erratic blocks are all to be found. But the district hardly gives the impression of intense glaciation except here and there. The change of the V-shaped stream valleys into a U-shape by the action of glaciers is not common, unless along the western fjords. The abundant glacial and inter-glacial material which covers the Burrard Peninsula to the south of the Inlet is a far more striking evidence of the Ice Age than most of the phenomena which are found among the mountains. Professor Burwash has recently pointed out that the most promising line of local research in glacial geology will combine the study of glaciation with that of changes of level in the land itself. The evidence for this must be sought for chiefly in the mountain valleys of the Coast Range.

It is only right to make due acknowledgment of the friendly encouragement and active assistance which the geological section of the Club has received from Mr. R. W. Brock, Director of the Geological Survey of Canada. The microscopic examination of the rock specimens collected by Mr. Gray was made by Mr. O. E. LeRoy of the Survey, whose work in the district has given to his suggestions a special value.





THE construction of the Pacific Great Eastern Railway will open up in the section between Newport at the head of Howe Sound and Lillooet, a distance of 120 miles, one of the greatest playgrounds on the North American continent. Thither will flock thousands of tourists from all parts of the world to enjoy the majestic scenery or to engage in all forms of healthy outdoor recreation. The attractions of this almost unknown region are varied. Fishermen can be assured of splendid sport in the countless streams and numerous lakes that exist along the route, while mountain climbers will discover scores of rugged peaks and glaciers that have not as yet been scaled. Up to the present this region has been almost inaccessible owing to the lack of transportation facilities. A narrow pack trail, hugging the edges of rocky cliffs and winding over yawning precipices, extends from Newport across the summit of the Coast Range to Pemberton Meadows, about sixty miles. Sportsmen have hitherto been content to penetrate less than ten miles inland from the Coast, the region beyond being to them a veritable howling wilderness. Not a few members of the British Columbia Mountaineering Club have won the distinction of having ascended Mount Garibaldi, twelve miles east of Newport. The climb from the valley is over 9,000 feet. Mount Murchison, with an elevation of 6,000 feet on the west side of Howe Sound, has also been conquered by other intrepid explorers.

With the completion of the railway all the present unfavorable conditions will be changed. The line is now being extended north up the narrow valley of the Cheakamus River, a clear and swift-running stream which, fed by many smaller tributaries, takes its rise in the melting glaciers on the summit of the range. This river is described as one of the best trout streams in British Columbia. Cataracts, pools and rapids abound in its sinuous and tumultuous descent to tidewater. There is a plateau six miles long on the summit. It is almost level and dotted with three lakes, the largest of which, Green Lake, is three miles in length. Their waters literally teem with rainbow trout and grayling. These lakes are all connected by creeks. Green Lake lies farthest north and its waters overflow into Green River, which descends the north slope of the range into the Lillooet River at Pemberton Meadows. The other two lakes flow into a tributary of the Cheakamus. They are all fed by scores of glaciers which surround the plateau like a vast amphitheatre.

Railway engineers engaged on the location survey have declared that in all their experience they have never enjoyed better fishing than that afforded in these lakes, which are situated at an elevation of about 3,500 feet above sea level. Some of the surrounding peaks attain an altitude of 9,500 feet. The upper reaches of the Cheakamus and the Green River are densely wooded and are the haunt of deer and partridge, while black bear and grizzlies on the higher peaks are very numerous, according to the reports of trappers. Goat and sheep are also very plentiful. It is certain that a few years hence will see the erection of a large summer hotel on the summit of the divide for the accommodation of tourists and other pleasure seekers. Every city along the Coast will send its hundreds of visitors as soon as the attractions of this region of scenic grandeur and good sport become better known.

Patronize the advertisers and mention "The Northern Cordilleran."

SURGICAL SHOE SPECIALIST FOR THE HOSPITALS OF BRITISH COLUMBIA

CONSERVATION FOR EVERY SHOE NEED EXAMINED

CHAS. WEBB

160 CORDOVA ST. W.
11 DOORS EAST OF CAMBIE


FASHIONABLE SHOE MAKER

ARTISTIC REPAIRING

**ALPINE CLIMBING BOOTS
A SPECIALTY**

**HUNTING AND SURVEYING
SHOES TO ORDER**

THE LARGEST STOCK OF "K" SHOES ON THE
AMERICAN CONTINENT.

"K" 

For any
wear
and every
where

All Styles, all Leathers, all Fittings for Men,
Boys and Ladies

**WOOD
THE SHOE SPECIALIST**

160 CORDOVA ST. WEST - - - 11 DOORS EAST OF CAMBIE

Patronize the advertisers and mention "The Northern Cordilleran."

London & British North America Company, Ltd.

WITH WHICH IS INCORPORATED

Mahon, McFarland & Proctor, Ltd.

Real Estate and Financial Brokers

Estates Managed

Inside Revenue Producing or Unimproved Properties

*Subdivisions in Point Grey, South Vancouver
and North Vancouver*

INSURANCE OF EVERY KIND

MORTGAGE LOANS

LONDON BUILDING,

VANCOUVER, B. C.

PINNER'S HALL,

AUSTIN FRIARS,

LONDON, E. C.

Patronize the advertisers and mention "The Northern Cordilleran."

EFFICIENCY
PRICE
SERVICE



PHONE
SEYMOUR
7169

WORLD
BUILDING
VANCOUVER

DAVID SPENCER LIMITED

RECOMMEND THE ADVANTAGES OF THEIR MAIL ORDER SERVICE
TO BRITISH COLUMBIA MOUNTAINEERS AND THE
GENERAL READERS OF THIS MAGAZINE

The large stocks of Merchandise carried, which include Groceries and Meats, place the Spencer store in an advantageous position to supply the commission department of Shooting, Fishing, Mountaineering, Camping, Picnic and Outing parties of all kinds. All orders for provisions shipped immediately received. No delay.

Write our Mail Order Department for Illustrated Catalogue and latest Price Lists of Groceries and Meats.

DAVID SPENCER LIMITED

VANCOUVER, B. C.

Patronize the advertisers and mention "The Northern Cordilleran."

Mountaineering Supplies

We carry in stock a full supply of goods suitable
for local mountaineering requirements:

Blankets, \$2.75 to 6.50 per pair
Woolen Shirts from \$1.50 to \$4.50
Khaki Shirts from \$1.00 to \$3.00
Khaki Pants, \$1.50, \$1.75, \$2.00

Corduroy Pants from \$3.50 to \$5.00
Heavy Woolen Sox, 3 pairs \$1.00
Woolen Mitts, 35c. and 50c. pair
Oilskin Suits from \$3.00 per suit

We are also importing from Europe the Rucksack in a style
which is very popular in the Swiss and Bavarian mountains,
and also the non-frayable Puttees, and expect to have these
on sale by May 1st, 1913.

Clubb & Stewart

Agents for 10th Century Brand Clothing
Men's and Boys' Outfitters and Furnishers

Phone Sey. 702

309-315 Hastings St. W., Vancouver

Terminal Steam Navigation Co. LIMITED

DAILY HOWE SOUND ROUTE

S.S. Bowena leaves Union S.S. Co. Dock daily at 9.15 a.m. for
Caulfields, Bowen Island, Porteau, Britannia Mines, Newport and Mill
Creek. Returning, arrives Vancouver about 7 p.m.

Sunday boat leaves at 10.30 a.m. for Caulfields, Bowen Island,
Britannia Mines, Porteau, Newport and Mill Creek. Returning, arriving
at Vancouver about 6.30 p.m. For information Phone **Seymour 6330**,
Night Call **Seymour 309K**.

TOURISTS and OTHERS

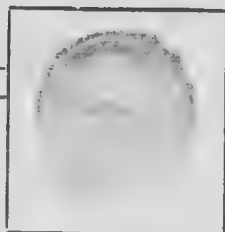
From the decks of our steamers can see in one day all the beauties
of an Alaskan trip. Beautiful Mountains, Cascades, Snowfields and
Glaciers.

Union Steamship Dock

SAILINGS SUBJECT TO CHANGE WITHOUT NOTICE

Patronize the advertisers and mention "The Northern Cordilleran."

We are Originals



Not Imitations

LOOSE LEAF SYSTEMS

Vertical and Card Filing Systems
Typewriter Supplies
Blank Books

WESTERN SPECIALTY LIMITED

331 Dunsmuir St., Vancouver, B. C.
(Alcazar Hotel Building)

TELEPHONE SERVICE CONNECTING ALL DEPARTMENTS
SEYMOUR 3526 AND SEYMOUR 3527

Patronize the advertisers and mention "The Northern Cordilleran."

HR
G505
N6

THE
LIBRARY OF THE
MUSEUM OF
COMPARATIVE ZOOLOGY
AT
HARVARD UNIVERSITY
CAMBRIDGE, MASS.



